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BLACK HILLS NATIONAL FOREST NOXIOUS WEED MANAGEMENT PLAN

ENVIRONMENTAL ASSESSMENT

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Chapter I

Purpose and Need for Action

INTRODUCTION

This Environmental Assessment (EA) describes the direct, indirect, and cumulative impacts of two management alternatives, No Action and Proposed Action, for management of noxious weeds on National Forest System (hereinafter referred to as NFS) lands within the Black Hills National Forest (hereinafter referred to as the Forest) in the States of Wyoming and South Dakota.

Development of this document is based on direction contained in the National Forest Management Act (NFMA), the National Environmental Policy Act (NEPA) of 1969, the Federal Noxious Weed Act of 1974, the Endangered Species Act of 1973, Presidential Executive Order 13112 for the Management of Invasive Species (1999), the 1997 Revised Black Hills National Forest Land and Resource Management Plan and attendant 2001 Phase I Amendment, and other pertinent federal laws, state statutes, and guidelines directing the management of noxious weeds within the States of Wyoming and South Dakota.

The Forest Plan, the U.S. Forest Service Rocky Mountain Noxious Weed Management Strategy (1999), and the USDA Forest Service Guide to Noxious Weed Prevention Practices (2001) prescribe management strategies and direction to contribute toward the attainment of goals and objectives for the management of noxious weeds within the Forest. This project was initiated by the Forest Supervisor to assess opportunities to implement direction for management of noxious weeds on NFS lands and cooperative jurisdictions within the Forest where warranted.

This EA does not document a decision. The purpose of this document is to disclose the effects and consequences of alternative actions considered in detail. Using information in the EA, the Forest Supervisor renders a decision based on consideration of project alternatives and public comment. This decision is documented in the Decision Notice and Finding of No Significant Impact.

PROJECT AREA DESCRIPTION

The project area for the BHNF Noxious Weed Management Plan includes all NFS land within the Forest boundary (see Figure I - Project Location Map).

The Forest lies in western South Dakota and northeastern Wyoming on the Missouri Plateau of the Great Plains. Its boundaries include most of the Black Hills, a mountainous area approximately 125 miles long north to south and 60 miles wide east to west, and the Bearlodge Mountains in northeastern Wyoming. Portions of the Forest lie within Custer, Fall River, Lawrence, Meade, and Pennington Counties in South Dakota and Crook and Weston Counties of Wyoming. Nearby cities include Rapid City, Lead, Deadwood, Spearfish, Sturgis, Hill City, Custer, Hot Springs and Edgemont in South Dakota, and Newcastle and Sundance in Wyoming.

PROPOSED ACTION

The Forest is proposing the Black Hills National Forest Noxious Weed Management Plan to manage the spread and establishment of existing and predicted noxious weed infestations on National Forest System (NFS) lands over the next 10 years.

The proposed management plan incorporates integrated strategy elements and prevention practices designed to reduce and contain existing infestations on approximately 82,000 acres prioritized for management, and mitigate and control approximately 14,250 acres of future infestation predicted to occur from implementation of scheduled Forest management activities over the coming decade. These management elements are specifically designed to improve current Forest weed management efforts in the following areas:

- Prevention and Education
- Administration and Planning
- Integrated Control
- Inventory/Mapping/Monitoring
- Research

A detailed discussion of the above management elements and their incorporation into the proposed action are discussed in Chapter II.

The plan will be implemented and amended in accordance with Forest Service management direction, including: Forest Plan direction and attendant amendments (Phase I and II); revised regional manual direction for noxious weed management (FSM 2080.5); and the 2001 USDA Forest Service Guide to Noxious Weed Prevention Practices. In addition, Wyoming and South Dakota guidelines for the coordinated management of noxious weeds and other state statutes will also be considered and incorporated in plan implementation.

PURPOSE AND NEED

The purpose of the Proposed Action (Management Plan) is to increase the scope of noxious weed management on the Forest to achieve net reduction and containment of existing weed infestations over the next 10 years while mitigating future infestations predicted from scheduled Forest projects

Establishment and spread of noxious weeds on public and private lands across the United States have become critical land management concerns. Escalating infestations of noxious weeds are reducing forage and crop production, displacing native plant communities, and reducing land values across the country. Land managers are challenged to develop and implement effective strategies for prevention, control and management of noxious weeds.

Forest habitats within the Forest historically have been subjected to recurrent disturbances both natural and man-made including timber management, recreation, mining, grazing, road development, and wild and prescribed fire. Fragmented land jurisdictions and associated management activities have also influenced noxious weed establishment and spread on National Forest Systems Lands (NFSL) and adjacent lands in the Black Hills region. These activities and associated disturbances have increased the establishment and spread of noxious weeds over time.

EXISTING CONDITION

Based on field reconnaissance and monitoring reports compiled over the past ten years, district personnel estimate that over 80 percent of NFS land within the Forest are infested with varying populations of noxious weeds. To date, district personnel have treated and mapped approximately 82,000 acres of existing infestation. The Forest has been treating/re-treating approximately 35,000 acres (40 percent) of this acreage with biological and herbicide control measures at a program level of approximately 3,500 acres annually over the past 10 years. This treatment has occurred primarily in association with scheduled timber management projects. The remaining 47,000 acres of infestation are located outside of Forest project areas, and are in need of long-term (7-10 years) treatment/re-treatment to reduce continued establishment and spread of noxious weeds.

During the summers of 2000 and 2001, approximately 105,510 acres of land within the Black Hills Forest burned from wildfires: Jasper (83,510 acres), Elk Mountain (25,000 acres), and other surrogate wildfire complexes. These fires affected an array of land ownerships within the Forest boundary, including Wyoming and South Dakota State lands, NFS lands, Bureau of Land Management (BLM), and private ownership. While noxious weed mitigation measures are currently being implemented over the next 3-5 years in these areas in accordance with wildfire recovery efforts, comprehensive inventories of noxious weeds have not been completed for these burned areas at this time. However, Forest personnel have documented increased establishment of noxious weeds

within these areas, and predict substantial establishment and spread of weeds to levels beyond the ability of personnel to control in the absence of long-term (5-10 year) monitoring and treatment.

PREDICTED FUTURE CONDITION

Implementation of Forest management activities scheduled to occur through the year 2010 (see Chapter IV - Cumulative Effects) are predicted to produce an additional 22,300 acres of noxious weed infestation from associated ground disturbing impacts in the absence of extended management. These activities include timber management, recreation, livestock grazing, prescribed fire, and road construction/maintenance. While mitigation measures incorporated in current Forest timber program management actions are expected to mitigate approximately 6,380 acres of this future infestation, continued treatment beyond current management is needed to attain desired control and containment objectives on these areas. In addition, establishment and spread of noxious weeds on the remaining 7,780 acres of infestation associated with road construction and maintenance, prescribed fire, and livestock grazing activities are expected to escalate within NFS habitats and surrounding land ownerships without incorporation of integrated noxious weed mitigation and control measures at levels above that of current project approaches (Chapter III, Table III-2.).

Aside from Forest activities that directly influence weed infestation, an additional 8,100 acres of potential infestation associated with scheduled land exchanges and recreational campground and trail management could occur without incorporation of noxious weed prevention, mitigation, and control measures to minimize potential infestations (Chapter III, Table III-2.).

In order to achieve effective mitigation and control of future infestations while attaining desired reduction and containment of existing noxious weed infestations, a comprehensive approach (plan) is needed to implement updated regional and Forest Plan direction on the Forest over the next 10 years. To obtain desired management levels, the plan should provide for coordinated management with affected Forest stakeholders to mitigate the spread and establishment of noxious weeds to and from adjacent land ownerships, while expanding the scope and intensity of noxious weed management on the Forest.

Key components of the plan will include provisions for environmentally sound treatment applications and comprehensive coordination with affected Forest stakeholders.

Specific objectives of the comprehensive weed plan are:

- Implement and achieve Forest Plan goals, objectives, standards and guidelines for maintenance and restoration of native plant communities and habitats through the reduction and control of noxious weeds.

- Improve management of noxious weeds on the Forest through implementation of the regional noxious weed management strategy elements incorporated in the proposed weed plan. Focus on achieving control, containment, and net reduction of existing noxious weed infestations from FY 2002 and beyond, by increasing current treatment levels, and mitigating anticipated establishment and spread of noxious weeds predicted to result from implementing scheduled Forest activities.
- Provide Forest leadership toward fostering and improving coordinated management strategies and multi-funding between affected state and federal agencies, local counties, and private stakeholders to provide timely prevention, detection and control of noxious weeds across jurisdictional boundaries within the Forest. These strategies should provide for sharing of expertise, information, resources and processes to improve the effectiveness and efficiency of all agency weed management programs.
- Strengthen Forest consistency and compliance in the areas of NEPA analysis affecting noxious weed management.
- Respond to emerging Forest problems for noxious weed management, and provide incentives to agencies and participating stakeholders that take innovative and pro-active steps to manage noxious weed infestations within the Forest.

FOREST NOXIOUS WEEDS TARGETED FOR MANAGEMENT

Table I-1 lists noxious weeds identified for treatment on the Forest and adjacent federal, state, private lands. The list is consistent with noxious weed species identified in Wyoming and South Dakota. The table also indicates Forest priority weeds that pose the highest threat to natural ecosystems on the Forest because they are already established on or near the Forest. This is not an all-inclusive list, such as plants poisonous to livestock, and does not preclude the listing of other species in the future. Moreover, inventories of existing infestation identified in the table only reflect infestations that have been mapped and treated/re-treated over the past 10 years. Many more acres of infestations that have yet to be inventoried and prioritized for treatment Forest-wide have been identified by Forest personnel, county agents, local ranchers, and private landowners.

Table I-1: List of major Forest noxious weeds targeted for management. A complete list of current state and regional noxious weeds pertinent to Forest management is found in Appendix B.

COMMON NAME	SCIENTIFIC NAME	FOREST PRIORITY	ACRES INVENTORIED
Sulphur Cinquefoil	*Potentilla recta*	High	3
Canada Thistle	*Cirsium arvense*	Low	66,976
Leafy Spurge	*Euphorbia esula*	High	5,854
St. Johnswort	*Hypericum perforatum*	Medium-High	1,025
Common Mullein	*Verbascum thapsus*	Low	2,292
Whitetop	*Cardia spp.*	Low	

COMMON NAME	SCIENTIFIC NAME	FOREST PRIORITY	ACRES INVENTORIED
Perennial Pepperweed	*Lepidium latifolium*	Low	
Common Tansy	*Tanacetum vulgare*	Meduium	920
Skeletonleaf Bursage	*Ambrosia tomentosa*	Low	
Russian Knapweed	*Centaurea repens*	High	
Yellow Toadflax	*Lineria vulgaris*	High	402
Dalmation Toadflax	*Linaria genistifolia*	High	
Scotch Thistle	*Onopordum acanthium*	Low	
Musk Thistle	*Cardus nutans*	Low	2,690
Yellow starthistle	*Centaurea solstitialis*	High	
Plumeless Thistle	*Carduus acanthoides*	Low	
Dyers Woad	*Isatis tinctoria*	High	
Houndstongue	*Cynoglossum officinale*	Medium	948
Spotted Knapweed	*Centaurea maculosa*	High	634
Purple Loosestrife	*Lythrum salicaria L.*	High	
Saltcedar	*Tamarix ramosissima*	High	

DECISIONS TO BE MADE

Based on the analysis documented in this EA, the Forest Supervisor will make decisions that direct how the Forest will implement noxious weed management to meet the purpose and need for projects. Decisions to be made are:

- At this time, where and under what circumstances should Forest Plan direction for noxious weed control be implemented on the Forest? What treatment methods should be applied? What is the scope and intensity of application for current infestations?
- For proposed Forest projects and activities, what are the risks of unacceptable establishment and spread of new noxious weed invasions? What mitigation measures are appropriate to reduce these risks for future infestations?
- What are the program priorities for the Forest Noxious Weed Management Plan including:
    1. Eradication of new infestations of noxious and exotic weeds where feasible.
    2. Prevention of new invasions.
    3. Control and integrated weed management of existing infestations.

4. Monitoring of where, when, and how noxious weeds are treated within the Forest, and effect of proposed treatment strategies.
5. Emergency spill plans for chemical agents and upgrading of existing chemical storage facilities.

- What opportunities are available to foster unified efforts with affected stakeholders for prevention and control of noxious weeds within the Forest and cooperating jurisdictions? How should those opportunities be coordinated for the best service to the public?
- How can the Forest improve public education and awareness about noxious weed prevention in coordination with affected stakeholders and local weed districts, and where they exist?

SCOPE OF THE ANALYSIS

This proposal is limited to site-specific actions designed to address management of noxious weed infestations on NFS land within the Forest that have been identified for treatment/re-treatment, and analyzed for implementation of the proposed action to prevent future infestations.

The areas evaluated for alternative effects are based on implementation of scheduled management actions and differ by resource use and influence of associated impacts. The analysis areas are identified by Forest activities in Chapter III.

It is anticipated that the need to manage future infestations will occur outside of NFS project areas analyzed in this EA. In those cases, Forest personnel will assess site-specific conditions and predicted impacts for treatment against this EA and attendant Decision Notice. Appropriate management decisions will be issued in accordance with NEPA requirements.

DIRECTION PERTINENT TO THE ANALYSIS

The Forest Plan established management direction for prevention, control, and containment of noxious weeds on NFS land within the Forest. This direction is documented in Goals and Objectives (Forest Plan, page I-13), and Forestwide Standards and Guidelines (Forest Plan, page II-59). In addition, both national and regional direction recently established policy pertinent to noxious weed management. Following is a summary of this direction pertinent to this analysis.

National Policy and Direction

Presidential Direction: Executive Order 13112 of February 3, 1999

Executive Order 13112 documents Presidential direction to affected federal agencies to "…identify actions subject to the availability of appropriations... encourage planning and action at local, State, and regional ecosystem-based levels... and prepare and issue Invasive Species Management Plans.... to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive (plant) species cause.

USDA Forest Service Guide to Noxious Weed Practices

The Noxious Weed Prevention Practices Guide provides a comprehensive directory of weed prevention practices for use in Forest Service planning and wildland resource management programs, activities and operations on a long-term basis. The Guide is supported by national agency noxious weed policy and strategy and supports implementation of the 1999 Executive Order on Invasive Species Management. While implementation of practices contained in the Guide are considered optional (with the exception of implementation of equipment cleaning contract provision WO-C/CT 6.36 and enforcement of weed-free feed orders (FSM 2081.03), all practices contained within the guide have been analyzed and incorporated for project implementation and are considered an integral component of the Forest noxious weed prevention strategy and are approved for implementation where appropriate.

Regional Policy and Direction

In addition to updated regional direction incorporated in R-2 supplements to Forest Service Manual Direction guiding management and policy direction for noxious weed Management (FSM 2080), the USDA Forest Service Rocky Mountain Region (R-2) Noxious Weed Management Strategy (May 1999) provides management objectives and strategy elements for management of noxious weeds on all Forest's in the Rocky Mountain Region from FY 2000 and beyond and are incorporated as guiding management for Black Hills Noxious Weed Management Plan. These strategies, along with the Chief of the Forest Service's Natural Resource Agenda and "Stemming the Invasive Tide" initiative, focuses on three objectives:

- Increase noxious weed program leadership, emphasizing cooperative partnerships...in addressing the strategy elements...
- Strengthen consistency and compliance in areas of NEPA, applicator certification, and herbicide storage practices...

- Respond to emerging problems and opportunities...by emphasizing an interdisciplinary [weed] management program, using multi-financing to [treat and control weeds] according to local needs and opportunities...

Strategy Elements

Prevention/Education: Emphasize prevention and education/training as an essential and cost effective methodology. The following actions were identified: train field personnel and the public to recognize new invaders; develop and implement best management practices as appropriate; employ clauses for weed prevention in all contracts and permits, as practical; post weed forage regulations and [enforce]; and conduct educational and awareness programs.

Weed Control: Substantially raise the number of acres treated on the Forest; the goal is net reduction in infested acres from FY 2002 and beyond by applying integrated weed management methods and targeting priorities based on values at risk.

Inventory/Mapping/Monitoring: NFS units will maintain up-to-date noxious weed inventories using appropriate, cost-effective methods. Design inventories by placing priority on invasion routes (roads and trails), staging areas (e.g. trailheads and campgrounds), and disturbance areas (timber sales and construction). Follow national mapping standards. Conduct monitoring to evaluate success of treatments and identify needs for re-treatment.

Research: Coordinate with Forest Service Research and State Cooperative Extension on [management] needs.

Administration/Planning: Forest units will multi-finance weed management; encourage cooperation and coordination with appropriate state, county, and other weed management entities; and integrate weed management in Forest planning and project NEPA.

Forest Plan Direction

Objectives

230. Eradicate or limit spread (acres) of new introductions of non-native pests (insects, diseases, plants) to minimize ecosystem disruption.

231. Prevent new infestations and manage to reduce established infestations of noxious weeds. Treat 3,600 acres per year during the next ten years to limit noxious weed infestations.

232. Inform the public about noxious weed prevention, in coordination with local weed districts where they exist.

Standards and Guidelines

4301. For all proposed projects or activities, determine the risk of noxious weed introduction or spread, and implement appropriate mitigation measure. **STANDARD**

4302. Use biological control methods whenever practical, and whenever protecting other resources is desired, such as water quality. **GUIDELINE****

4303. Develop a noxious weed management program that addresses the following components: awareness, prevention, inventory, planning, treatment, monitoring, reporting, and management objectives. Control noxious weeds using the following priority order:

a. new invaders;

b. new areas of infestation;

c. spreading or expanding infestations;

d. existing infestations.

GUIDELINE

4304. Treat individual plant or group of plants, instead of broadcast chemical treatments, where practical. **GUIDELINE****

4305. Apply chemical agents at the lowest effective rates, and as large droplets or pellets to reduce drift. Follow label directions. **GUIDELINE****

4306. Use certified noxious weed-free seed, feed and mulch. **STANDARD**

4307. When feeding recreational livestock and other ungulates use certified noxious weed-free feed. **GUIDELINE**

4308. Use buffers around water sources, lakes, wetlands and streams to keep concentrations of chemical agents in water well below those harmful to drinking, irrigation, aquatic life and non-target vegetation. Treatment of individual plants with aquatic-labeled chemical agents may occur in buffers. **STANDARD**

Amended Phase I Direction for the 1997 Black Hills Forest Plan

In May 2001 the Regional Forester issued a decision to implement key management instructions incorporated in the Chief of the Forest Service 1999 Appeal Decision of the 1997 Revised Forest Plan. This decision, referred to as "Phase I", amended the 1997 Revised Forest Plan and provides scientifically based modifications to management direction which are designed to provide additional assurance that management options and level of risk for several sensitive plant and animal species will not be foreclosed by the effects of projects during the period needed to re-evaluate long-term species diversity and viability management on the Forest. The Phase I Amendment is expected to remain in effect for a period of 2–5 years pending long-term adjustments to the Forest Plan. Accordingly, this document incorporates and is guided by all pertinent changes to management direction identified in the Phase I decision (1997 Black Hills National

Forest Land and Resource Management Plan Phase I Amendment Decision Notice and Environmental Assessment 2001; Decision Notice – Appendix – Changes Made in this Decision).

PUBLIC REVIEW AND COMMENT

During the past decade, management of noxious weeds on the Forest has been guided by direction based on the previous Land and Resource Management Plan (1983). The Forest committed to developing a noxious weed management plan to implement updated information in the Forest Plan.

On February 5, 1999, the Forest initiated the BHNF Noxious Weed Management Plan with the release of a proposed action for public review and comment. Commensurate with release of the proposed action, the Forest conducted public scoping meetings during the months of February and March at locations in five counties within the Forest, in a comprehensive effort to describe the proposed action and solicit issues from all stakeholders affected. In addition to public response solicited and received through letters, telephone conversations, and meetings, the proposed action was featured in newspapers and on radio stations covering Forest activities in South Dakota, Wyoming, Nebraska, and Montana.

On August 27, 1999, the Forest released an environmental assessment (EA) for a 30-day public review and comment period. The comment period ended on September 27, 1999. In an effort to provide additional opportunity for public and agency comment on the project, the Forest re-started the comment period on October 8, 1999, providing an additional 30-days for public review and comment. In total, individuals and affected stakeholders were provided over 60 days to submit input toward the development of the Forest Noxious Weed Management Plan. All comments received on the project were incorporated in the EA and/or considered in the selection of the preferred alternative. Appendix D of the EA contains a complete listing of comments received on the project and the Forest Service response to those comments.

On October 12, 1999 the Chief of the Forest Service issued a decision relative to the 1997 appeals to the Forest Plan. In part, the decision included instructions for further analyses concerning issues of species viability for plant and animals. In an effort to comply with instructions in the appeal decision, the Forest proposed adjustments to the 1997 Revised Forest Plan in two phases.

The initial effort (Phase I) of Forest compliance with the Chief's appeal decision included a short-term (2 – 5 years), non-significant amendment to the Forest Plan. The intent of Phase I is to 1) provide assurance that the Forest's actions during the future 2 – 5 year interim period will not foreclose management options needed to re-evaluate the sufficiency of the Forest Plan in maintaining plant and animal species viability and diversity, and 2) ensure that adequate habitat for species for which there may be a viability concern is maintained on the Forest until additional analysis of species viability and diversity is completed.

On May 18, 2001, the Regional Forester issued a Decision Notice and Finding of No Significant Impact for the Phase I amendment. The decision amended the Forest Plan and included additional protection measures for wildlife and plant species and their associated habitats.

As a result of the 1999 Chief's appeal decision and Phase I amendment of the Revised 1997 Forest Plan, the Forest delayed issuance of the BHNF Noxious Weed Management Plan pending incorporation of Phase I direction.

IDENTIFICATION OF ISSUES

In developing the proposed action and determining the relevant issues to the proposed action, the Interdisciplinary Team (IDT) reviewed public and agency comments generated during the scoping process, and comments germane to the project analysis area. Pertinent comments from these sources were used to develop the significant issues for the decision. Significant issues are points of unresolved conflict with the proposed action identified during scoping efforts and analyzed in detail.

Comments identified during scoping were evaluated against the following questions to determine whether or not the concern would be a major factor in the analysis process.

- Has the concern been addressed in a previous analysis, such as a previous environmental document (EA or EIS), the Forest planning process, existing resource conservation agreements, or through legislative action?
- Is the concern relevant to and within the scope of the project (purpose and need), the decisions being made, and does it pertain directly to the proposed action?
- Could the concern be resolved through design and location of activities or mitigated (avoiding, minimizing, or compensating for the effects of the Proposed Action) in all alternatives?

A number of the concerns were determined not significant or outside the scope of this proposal; additional concerns were identified that would not be affected by this project, or the impacts could be resolved through project design or mitigated. A complete listing of all comments considered during scoping and an explanation of how each was addressed by the IDT is contained within the planning record.

Based on interdisciplinary review of all information received from the scoping process, the project IDT determined that there were no significant issues for the project, or resource concerns or impacts that could not be resolved or mitigated through proper implementation of the proposed action. Moreover, the majority of public concerns focused on operational efficiency and the scope of current Forest noxious weed efforts, rather than impacts to the resource or human safety issues.

Key concerns that were identified by the public and incorporated in the development of the EA are summarized below and addressed in Chapter II - Comparison of Alternatives.

A detailed analysis of specific comments to the proposed action and how they were incorporated in the development of the pre-decisional EA are included in the project planning record. A complete list of Public comments and Forest response to the pre-decisional EA that were used to develop the decision are included in Appendix D - Public Comments.

- The Forest should develop and implement a certified noxious weed-free restriction.
- Develop cooperative management agreements with county and state agencies.
- Develop and implement a Forest-wide comprehensive monitoring plan to monitor effectiveness of management over time.
- Improve Forest noxious weed education and awareness efforts for the public and affected stakeholders.
- Improve priority of treatment strategies: total eradication of noxious weeds is not a realistic goal.
- The Forest needs to improve coordination and control efforts between agencies and private stakeholders to [adequately] treat noxious weeds on NFS land.
- The Forest needs to treat more acres of weed infestation than the Forest Plan has scheduled for treatment. ..."treating 3,000 of 82,000 acres per year is only treating 3.66 percent of the problem."
- Improve Forest operating procedures used in application of herbicides.
- Emphasize bio-control over herbicide application.
- Improve incorporation of updated mitigation measures in design of future Forest projects.
- Provide for human and environmental safety from herbicide application.

Chapter II - Alternatives Including the Proposed Action

INTRODUCTION

This chapter describes and compares the two alternatives, including the proposed action that fully meets the project purpose and need identified in Chapter I, and a no action (current management) alternative.

An alternative is a combination of activities designed around a particular emphasis or theme. The alternatives reflect different responses to issues identified through the scoping process, and each alternative produces different environmental effects.

This chapter concludes with a comparative summary of the environmental consequences, activities, and outputs of the alternatives considered in detail. This comparison combined with the more detailed disclosure of effects in Chapter IV, provides information to aid the decision maker in developing a reasoned choice between alternatives.

DEVELOPMENT OF ALTERNATIVES

The scoping process determined the significance of issues addressed in the analysis. Alternatives to the proposed action are considered to address those issues. Design and mitigation associated with or added to the proposed action successfully mitigated all significant issues. Other non-significant issues led to the creation of one or more alternatives that were also eliminated from detailed analysis.

As a result, only the no action and proposed action were analyzed in detail. Specific information on these alternatives follows.

Alternatives Considered But Eliminated From Detailed Study

Some issues to the Proposed Action identified other approaches to management on the project area. These approaches (alternatives) were evaluated by the IDT, but were eliminated from further study. A description of the alternatives, along with an explanation for dismissing them from further analysis, is presented below. These alternatives, along with the alternatives analyzed in detail, represent the range of alternatives considered for the project.

Aerial Spraying of Herbicides

Some agency stakeholders proposed broad-scale aerial application of herbicides to more effectively treat noxious weeds on the Forest. This method of application is presently being utilized by some county agencies in the Black Hills.

Aerial application is considered an effective approach to treating noxious weeds in agricultural settings or in large contiguous areas of NFS land in other areas of the West. However, the vast amounts of fragmented land ownership in the Black Hills and the difficulty of confining treatment to target NFS land acres, precludes aerial application as a viable treatment approach within the canopied and intermingled land ownerships at this time. However, within contiguous areas of NFS land affected by large, landscape-level wildfires, aerial treatment of herbicides may be a viable management option for control of noxious weeds in the future.

In addition, some citizens with health sensitivities to herbicides expressed concerns with the ability of the Forest to mitigate drift of herbicides applied in the air.

Largely due to the inability of Forest personnel to effectively confine application of herbicides to target areas, and to mitigate health risk to citizens sensitive to herbicides at this time, broadscale aerial spraying was not considered in detail for this project.

Exclusive Use of Mechanical/Biological Controls

Under this proposal, mechanical treatments and biological controls would be used exclusively to achieve the purpose and need for the project. No herbicide treatment would be used to control noxious weeds on existing infestation.

While considered a valuable method of treatment, the analysis for the project revealed that the most effective approach for managing noxious weeds on the Forest would be implementation of a combination of integrated treatments including herbicide application. Moreover, it was determined by the IDT that exclusive treatment using only one approach, be it mechanical, biological, or herbicides, would not adequately meet the purpose and need for the project. Based on the analysis, this proposal was dismissed from further consideration.

No Action – Discontinued Management of Noxious Weeds

A proposal was made to discontinue existing Forest management of noxious weeds at current levels and strategy, and analyze the alternative separate from the no action alternative. The basis for this approach was to provide the decision maker with information relative to the consequences of continuing to treat minimal acres of noxious weeds, i.e., not implementing national and Forest Plan direction for management of noxious weeds. Since eliminating noxious weed management on the Forest will violate Forest and agency direction, developing an alternative that eliminated action is

considered outside the discretion of the Forest to implement and will not meet project objectives. For these reasons, this alternative was eliminated from detailed study.

Continued Management Under State Laws and Authorities

Others suggested that existence of state laws provided precedent authority for the Forest Service to manage noxious weeds, and therefore exempted the Forest from the need to prepare an environmental assessment (EA) in support of existing management. This rationale was based, in part, on existence and designation of state laws and statutes for Wyoming and South Dakota that direct federal agencies to manage noxious weeds within state boundaries.

Implementation of federal actions, policies, and programs are tiered to, supported, and guided by federal laws and regulations established by Congress. While federal agencies often coordinate with state and county governments, and incorporate supporting laws into the design and development of federal actions and programs, state laws and statutes do not direct or over-ride federal authority. Therefore, direction for noxious weed management from the States of Wyoming and South Dakota, while properly incorporated in the proposed action, does not support the Forest continuing current noxious weed management outside of Forest Service direction (see Chapter I, Direction Pertinent to the Analysis) and National Environmental Policy Act (NEPA) requirements. Because the Forest has already considered and incorporated relevant state direction in its guiding Forest Plan and national agency direction, this alternative was eliminated from detailed analysis.

Alternatives Considered In Detail

This section describes the alternatives considered in detail, including the no action (Alternative 1) and proposed action (Alternative 2). Also featured in this section are mitigation and monitoring measures that will provide added resource protection and assessment of the effectiveness of the proposed action.

Description Of The Alternatives

Alternative 1 - No Action (Current Management):

This is a required alternative that provides a baseline against which impacts of the proposed action are measured and compared. In addition, under this alternative, noxious weed management, including application of integrated control methods, inventory/mapping, and public prevention, will continue to be implemented on the Forest in association with scheduled Forest projects (treating approximately 3,600 acres per year). The scope of noxious weed management on the Forest would be less comprehensive than the Proposed Action.

Alternative 2 - Proposed Action:

The proposed action was developed to fully meet the purpose and need for the project and to implement direction for noxious weed management in the Forest Plan and regional noxious weed management strategy.

The proposed action is a comprehensive plan comprised of an array of site-specific goals and objectives, and strategy elements designed to manage the spread and establishment of noxious weeds on approximately 82,000 acres of existing weed infestation and approximately 22,300 acres of predicted infestations from scheduled Forest activities on 887,000 acres. New infestations occurring on NFS land not covered under scheduled Forest projects are unknown at this time. Unscheduled projects or ground disturbing areas could include wildland fires, flood occurrences or insect and disease infested areas. The proposed action alternative treats an additional 2,400 acres of NFS land over the no action alternative. This provides for additional weed plan strategy elements including: mapping, inventory and monitoring evaluation of an additional 2,400 acres of weed infestations, development of grants and agreements with all Black Hills counties and affected stakeholders, and expanded scope of prevention/education strategies.

Features Common To Both Alternatives

The alternatives include the following features, and correspond to proposal maps contained in Appendix E (Figures II-1 thru 4):

Prevention and Education:

- The Forest will lead and provide for annual training and education seminars for Forest personnel, federal, state, and county agencies, Forest user groups, and the public to recognize new noxious weed invaders and understand Forest direction and implementation of the Black Hills Noxious Weed Management Plan.
- The Forest will develop/incorporate Forest Plan Best Management Practices (BMPs) for soil protection and re-vegetation (seeding) to mitigate establishment and spread of noxious weeds for scheduled Forest projects.
- Noxious Weed Best Management and Prevention Practices identified in the USDA – Guide to Noxious Weed Prevention Practices (Appendix B) are specifically incorporated in the proposed action and all prevention practices are to be implemented in accordance with Forest Plan direction as appropriate (USDA Guide, July 2001).
- Develop and implement project risk assessment measures to mitigate and prevent the introduction and spread of noxious weeds from Forest activities scheduled over the coming decade, including road maintenance/construction, prescribed burning, timber harvest, grazing management, land exchanges, recreation trail maintenance/construction, and recreation campgrounds and dispersed camping areas.

- The Forest will employ clauses for weed prevention in all contracts and permits as practical. In situations where Forest projects are scheduled to occur on areas infested with high densities of noxious weeds that are considered to be at high risk for spread, provisions for equipment washing may need to be required to mitigate spread and establishment of noxious weeds to adjacent NFS land and jurisdictions.
- The Forest will post and implement weed forage signing and regulations such as the Forest certified weed-free hay, mulch, straw, and forage special restriction and do compliance checking.
- The Forest will require use of certified noxious weed-free seed for use in any Forest managed seeding project.

Administration and Planning:

- The Forest plans to incorporate integrate noxious weed plan management guidelines, mitigation, monitoring measures, and consideration of weed issues into Forest planning initiatives and project design of Forest NEPA documents where appropriate. These considerations should focus on incorporating weed species management objectives, prioritizing mitigation by species of concern, and identifying special weed management areas and recommended treatments.
- The Forest plans to develop Coordinated Annual Operating Instructions and/or Memorandums of Understanding (MOUs) with all agencies and county weed boards to facilitate cooperation among affected land users and jurisdictions within the Forest. It is anticipated that these agreements will substantially expand the scope and effectiveness of noxious weed treatment within the Forest.
- The Forest plans to implement regional direction to establish additional funding from all Forest management activities to administer and implement the BHNF Weed Management Plan. The Forest proposes to develop grant and/or agreement plans to leverage funds where possible with participating counties, states, agencies/organizations, and grants to improve management of noxious weeds across jurisdictional boundaries in the Black Hills.

Integrated Control:

- The Forest will implement a combination of integrated control strategies to schedule treatment/re-treatment on existing infestation and mitigate and control new weed infestations based on the following treatment priority:

    1. Respond rapidly to infestations for new or target species with aggressive treatment to control or eradicate. Herbicides and mechanical treatments should be applied in these situations. Re-treat as needed. An invasion of noxious weeds into sensitive plant sites will be high priority for control. Control methods that are least likely to impact individual sensitive plants will be used.
    2. Treat small-scattered existing infestations in NFS land habitats that are at high risk of spread. Herbicides and mechanical treatments should be applied in

these situations. Re-treat as needed.

3. Treat or contain larger existing infestations, or infestations having a lower risk of spread. Treatments in these situations are expected to include establishment of insectaries, inoculation of pathogens, and perimeter treatment with herbicides to attain long-term reduction, containment, and control where practical.

   It is expected that specific implementation of the above control priorities will be further defined and clarified in the development of site-specific cooperative operating instructions and agreements as appropriate.

4. Combinations of integrated control methods proposed under the Forest weed plan include: treatment of infested areas with biological agents (including pathogens and insects); herbicide application; and manual/mechanical applications to achieve plan objectives with specific focus on annual treatment/re-treatment on NFS land currently infested or predicted to be infested with noxious weeds within the States of Wyoming and South Dakota to attain net reductions in existing infestations.

Operating Procedures:

- Environmental Protection Agency (EPA) approved herbicides will be applied in accordance with label application procedures and guidelines documented in the following analyses:
  1. FEIS for the 1997 Revised Black Hills National Forest Land and Resource Management Plan; Chapter III, pages III-189 through III-199, 1997.
  2. FEIS for the Custer National Forest Noxious Weed Management Plan; Chapter III Affected Environment, Pages 19-29, 1986.
  3. EA for the Big Horn National Forest Noxious Weed Management Plan; Chapters I and II, and appendices for control operating procedures, 1998.
  4. Guidelines for the Coordinated Management of Noxious Weeds for the State of South Dakota, 1992.
  5. Biology and Management of Noxious Rangeland Weeds; Section II, pages 145-438 1999: Oregon State University Press.
  6. Biological Control of Weeds in the West: Western Society of Weed Science, 1995.
  7. Pesticide/herbicide Risk and Use Assessment; USDA Forest Service Forest Health Protection, Washington D.C., August 1998.
- Herbicides will be primarily applied using handheld equipment (hose and handguns). Ground vehicles, backpack sprayers, all-terrain vehicles (ATVs), wickets and other equipment developed for spot treatment are methods also available. Use of spray booms mounted on ground vehicles may be used on a site per site basis where appropriate.
- Manual treatments will include hand pulling, grubbing with hand tools or hand cutting.
- Mechanical treatments will include mowing, plowing, disking, tilling or burning.

- Biological treatment will include establishment of insectaries for focused release of insects, inoculation with pathogens, or livestock grazing where appropriate.
- Integrated control methods to be implemented against target plants. Various noxious weeds respond differently to different control methods.
- Use of a spot treatment strategy to the extent possible and practical (as opposed to broadcast application).
- Use of the lowest application rate recommended for effective control of a given undesirable plant species.
- Only herbicides registered for aquatic use will be used in riparian and wetland areas.
- No spraying will occur when the wind velocity is high enough to result in off site drift.
- Spraying will not occur if air temperature exceeds the herbicide's volatilization point.
- Once initiated, weed treatment and monitoring must be implemented a minimum of five consecutive years to determine/maintain effectiveness of treatment and control measures.

Inventory/Mapping/Monitoring:

- The Forest will maintain noxious weed inventories. Surveys will be designed based on evaluation of project risk assessments and the following priority of integrated control:
    1. Invasion routes (roads and trails)
    2. Staging areas (trailheads and campgrounds)
    3. Disturbance areas (timber sales and construction)

Forest mapping will utilize GIS technology in accordance with National Mapping Standards. Prioritized treatment will be a direct result of using annual monitoring evaluations and inventories of existing noxious weed infestations.

Research:

- The Forest is to coordinate annually with Forest Service Research, the regional noxious weed coordinator, and state cooperative extension specialists, state and county weed boards and agencies on weed research to improve Forest management efforts.

MITIGATION MEASURES

The following mitigation measures will eliminate, minimize, or reduce impacts of the Proposed Action. The measures will provide added protection for the environment and would be implemented when needed.

- Guidelines found in FSM 2080 and FSH 2209.23, Chpt. 30, and in the Final Environmental Impact Statement (FEIS) referenced in the 1997 Revised Land and Resource Management Plan in Appendix D will be followed.
- Forest Service policies/guidance and EPA label instructions for herbicide application will be followed in implementing all treatment methods. This includes suspending herbicide applications whenever weather conditions could cause off-site drift or runoff and providing buffer zones along riparian areas.
- Domestic animals used to control an undesirable plant species will not be grazed in an infested area during the period of plant seed production and then moved to another vegetative community. This is intended to limit the spread of plant species through animal fecal material.
- Noxious weed control in the Black Elk Wilderness area will be done in accordance with the Forest Plan (3/97) Management Area 1.1A-4301 page III-11.
- Once undesirable plants are controlled on a site, the area will be seeded with desirable perennial plant species, and/or short-term annuals that are non-persistent, to establish a ground cover and prevent or retard re-establishment of noxious weeds. All seeding will be implemented at the discretion of the district manager and applied where necessary to achieve desired results.
- Ground-disturbing control methods will require a pre-treatment heritage resource survey.
- In areas where future ground disturbing activities are scheduled to occur within noxious weed infestations, appropriate weed treatment applications will be conducted prior to project implementation to reduce future spread and establishment.
- Treatment surveys and assessments to determine the presence and proximity of federally listed threatened and endangered, proposed or Region 2 sensitive plant species, human habitations and/or aquatic resources that may be at risk from weed treatments will be conducted by Forest botanists and range conservationist. These assessments will determine the appropriate application strategies prior to project implementation.
- Information will be provided to the public of herbicide control activities as needed; areas of high public use will be posted during the time of control and until the foliage is completely dry. When possible, spray applications will be accomplished when human use is likely to be low.
- Noxious weed management provisions in Forest wildfire recovery plans will be developed and incorporated to mitigate spread and establishment of noxious weeds where determined to be at high risk for invasion following wildfires.
- Requirements for noxious weed management will be incorporated in special use permits for Forest campground concessionaires, vendors, and other permittees as appropriate.

MONITORING REQUIREMENTS

The following measures have been designed to ensure that project activities are completed consistent with design standards and management practices.

- Representative treatment areas will be monitored prior to and after treatment to determine effectiveness of control.
- In areas of high undesirable plant densities and acreage, permanent long-term effectiveness monitoring techniques will be implemented. Photo trend studies may be used.
- Monitoring of herbicide use will be completed on an annual basis. Pesticide use reports will be completed at the end of the treatment season (generally in the fall) to record types and amount of herbicides applied. Daily logs will be kept within the corporate Forest database where control activities occur. Daily logs will include information on the type of herbicide, pounds of active ingredient applied per acre, gallons of solution applied, method of application, and location.
- Inventories of undesirable plants will be kept on each ranger district showing locations of undesirable plants and where treatment activities have occurred. Inventories will be updated on an annual basis to monitor the effectiveness of control techniques and new infestations.

COMPARISON OF OUTPUTS AND EFFECTS BY ALTERNATIVE

A comparative summary of the principle activities and environmental outputs and effects on the resource issues of concern associated with each alternative is presented in Table II-1. A brief discussion of the measurement indicators that will allow the Forest to monitor the effectiveness of treatment, and differences of effects between the alternatives follows (environmental effects are further discussed in Chapter IV).

Implementation of Control Methods

Project Measurement Indicators:

- Acres of existing noxious weed infestations treated/re-treated annually with integrated control methods.
- Acres of new infestations treated annually.
- Net reduction (acres) of priority noxious weed infestation Forest-wide as reported at three - five year increments.

Under Alternative 1 (no action) national, regional and Forest Plan direction for management of noxious weeds on the Forest will continue to be implemented through incorporation of Forest Plan direction (treatment of 3,600 acres per year) in scheduled

Forest projects and attendant NEPA analyses. As a result, noxious weed management will only occur within project areas. Treatment/retreatment of existing and future infestations in timber management projects will be discontinued after five years (KV funding limitations). Implementation of noxious weed management will occur in other Forest activities where funding is available and will occur only in association with scheduled projects. As a result of continued management, existing weed infestations on 82,000 acres of NFS land, predicted infestations from scheduled implementation of Forest activities, and new infestations occurring on areas outside of Forest projects and adjacent non-NFS land are expected to escalate over the next 10 years. Consequently, increased displacement of native plant communities and habitats, reduction in forage availability for livestock and wildlife, and reductions in scenic integrity Forest-wide will be expected to occur at increasing rates. Under Alternative 1, the Forest will not fully meet the purpose and need for the project and Forest Plan, and regional direction for the management of noxious weeds on the Forest.

Under Alternative 2 (proposed action) integrated control treatment/retreatment on existing, predicted, and new infestations on NFS land and adjoining land within the Forest will increase to a minimum 7,000 - 8,000 acres per year, including: a minimum increase in 2,400 acres per year (totaling 6,000 acres) of Forest treatment plus additional annual treatment (estimated at 1,000 - 2,000 acres annually) from cooperative agency agreements and treatment contributions fostered under the proposed action. In total, implementation of expanded long-term integrated weed control from Forest and cooperative agency efforts under the proposed action is expected to achieve effective annual prevention, control, and containment of existing and predicted noxious weed infestations, and long-term net reduction of existing infestation over the next 10 years. Additionally funding in support of the comprehensive forest weed program will provide for long-term funding commitment to implement treatment and monitoring elements of the plan past the current five-year limitation associated with timber sales under Alternative 1. This alternative fully complies with the spirit and direction of the Forest Plan and updated regional noxious weed direction.

Under Alternative 1 approximately 3,600 acres of noxious weed management will continue to be implemented Forest-wide on existing and predicted infestations. Under this alternative, management will continue to be limited to project areas, and predicted reductions of treated infestations will be approximately 25-50 percent of infestations treated continuously for 3-5 years (BHNF FEIS, pg. III-193) largely in timber sale areas. Under the proposed action, program management will increase 2,400 acres to a minimum annual program level of 6,000 acres and flexibility to treat/re-treat all priority areas throughout the Forest is expected to result in net reductions of 75 percent on areas treated continually for 3-7 years.

Weed Plan Inventory/Mapping/Monitoring Provisions

Project Measurement Indicators

- Acres of priority noxious weed infestations inventoried and mapped with GIS technology and in accordance with national standards.
- Acres of noxious weed infestation evaluated and prioritized for treatment on an annual basis.
- Acres of increase/decrease of weed infestation reported at three- to five-year increments per Forest Plan Monitoring Implementation Guide.

Under Alternative 1 inventory, mapping, and monitoring of noxious weeds will continue to occur in association with scheduled Forest projects. However, these activities will not occur on NFS land outside of scheduled projects. As a result, the Forest monitoring information will not fully comply with state agricultural reporting requirements for Wyoming and South Dakota, as required by state law.

Implementation of Alternative 2 will enable the Forest to comply with regional, state, and the Forest Plan reporting requirements for noxious weed management. This alternative will provide for an additional 3,000 acres of inventory and monitoring Forest-wide over the Alternative 1. Improved inventory and monitoring information facilitated by the monitoring schedule of the weed plan will also enable the Forest to improve coordination with Forest stakeholders participating in noxious weed management in the Black Hills and more efficiently prioritize, plan, and apply available resources for management.

Noxious Weed Prevention and Education

Project Measurement Indicators

- Development and implementation of cooperative noxious weed management grants, agreements, and weed management district plans with affected state and county agencies (measured in number of grants and agreements developed/renewed annually).
- Development of the weed plan public education and awareness strategies for noxious weed management, including training, publications, and school education programs.
- Implementation of Forest-wide certified noxious weed special restriction order as appropriate to reduce future noxious weed infestation.

Implementation of Alternative 1 will provide limited preventative education and management strategies and measures to mitigate the spread and establishment of noxious weeds on the Forest. Under this alternative, existing county treatment agreements will

continue and general public education and awareness programs will be limited to programmatic efforts. The Forest certified noxious weed order will continue to be implemented and enforced.

Under Alternative 2, development and funding of cooperative grants and agreements with Forest stakeholders will be substantially more comprehensive in scope (targeting all state, county, and private stakeholders) and is expected to significantly improve management of noxious weeds across jurisdictional boundaries across the Forest and mitigate the spread of noxious weeds both to and from NFS land acres.

Recreational livestock use and use of non-certified seed and straw in ground-disturbing construction projects is considered to be a contributor to establishment of new infestations of noxious weed Forest-wide. Under both alternatives, implementation of the certified noxious weed-free hay, mulch, straw, and forage order is expected to substantially mitigate future weed infestations occurring from these activities.

Development and implementation of external and internal noxious weed training and education strategies incorporated in the proposed action is expected to further mitigate future infestation of weeds within the Forest from Forest and non-Forest activities by transferring education to a broader scope of stakeholders than current efforts. Under Alternative 1, existing training and education efforts will continue to be limited in scope, primarily confined to agency personnel and county coordination.

COMPLIANCE WITH PERTINENT BLACK HILLS FOREST PLAN DIRECTION FOR MANAGEMENT OF NOXIOUS WEEDS.

Management direction incorporated in the Forest Plan complies with all relevant state, county, and federal laws pertaining to noxious weed management within Wyoming and South Dakota and the region. As an implementing document for the Forest Plan, the BHNF Noxious Weed Management Plan implements and fosters full compliance with these laws and directions within the project area. Alternative 1 meets Forest Plan direction, but does not adequately meet the spirit and intent of the regional noxious weed management strategy. Additionally, continuation of current management does not fully comply with updated state direction for weed treatment and reporting requirements.

Under proper implementation of both alternatives, the analysis determined that no adverse effects to humans or the human environment are expected to occur. In the event of accidental spillage of herbicides, implementation of clean-up provisions following State of South Dakota and Wyoming guidelines will be invoked to mitigate potential adverse effects.

Administration/Planning

Under Alternative 2, incorporation of project noxious weed evaluation, mitigation measures, and control methods in Forest-wide planning on all NFS land, project NEPA documents, permits, and contracts is expected to substantially reduce establishment and spread of anticipated weed establishment from scheduled Forest activities.

Under the Alternative 1, incorporation of noxious weed administration and planning elements will not provide for planning and administration of noxious weed infestations outside scheduled project areas. Incorporation of all noxious weed mitigation and prevention/control measures in permits, contracts, and NEPA documents will be the same as the proposed action.

Table II-1: Comparison of Outputs and Effects

PROJECT INDICATORS	ALT. 1 NO ACTION	ALT. 2 PROPOSED ACTION
IMPLEMENTATION OF INTEGRATED CONTROL METHODS.		
- Existing noxious weed infestations treated/re-treated annually with integrated control methods.	3,600 acres	6,000 - 8,000 acres
- New infestations treated annually.	Yes Limited to scheduled project areas.	Yes In addition to existing and future project areas, treatments will occur on prioritized areas on any NFS land and cooperating jurisdictions.
- Attain net reductions of priority noxious weed infestation Forest-wide as reported at three-year increments.	No The scope of continued management will not provide for control, containment, or reduction of existing and future infestations, nor mitigate current rates of infestations Forest-wide. Estimate attained reduction of approximately 25 -50 % of targeted infestations within 3 -5 years of continuous treatment	Yes Increased scope of treatments and strategies is expected to achieve net reductions Forest-wide in prioritized areas from Forest and cooperating agency efforts. Estimate attained reduction of 75 percent of targeted infestations within 3-7 years of continuous treatment.
- Priority noxious weed infestations controlled or contained annually.	No Treatment limited to scheduled project areas.	Yes Alternative provides for prioritized treatment Forest-wide.
- New infestations contained or eradicated annually.	Yes Only within scheduled timber management projects	Yes Forest-wide.

PROJECT INDICATORS	ALT. 1 NO ACTION	ALT. 2 PROPOSED ACTION
NOXIOUS WEED INVENTORY, MAPPING, AND MONITORING.		
Weed Plan Inventory, Mapping, and Monitoring Provisions.		
Project Measurement Indicators:		
- Priority noxious weed infestations inventoried and mapped with GIS technology and in accordance with national standards.	Yes 3,000 acres annually	Yes 6,000 acres annually
- Noxious weed infestation evaluated and prioritized for treatment on an annual basis.	Yes Limited to scheduled project areas	Yes Forest-wide
- Increase/decrease of weed infestation reported at five-year increments per Forest Plan Monitoring Implementation Guide.	Yes	Yes Alt.2 provides for more comprehensive evaluation.
NOXIOUS WEED PREVENTION AND EDUCATION.		
Project Measurement Indicators:		
- Cooperative noxious weed management grants, agreements, and weed management district plans developed and implemented with affected state and county agencies (Measured in number of grants and agreements developed/renewed annually).	Yes Limited to participating counties	Yes Provides for all counties and participating stakeholders
- Development of the weed plan public education and awareness for noxious weed management strategies, including training, Forest publications, school education programs.	Yes	Yes Alt.2 increases scope of program
- Implementation of Forest-wide certified noxious weed special restriction orders as appropriate to reduce future noxious weed infestation.	Yes	Yes
COMPLIANCE WITH PERTINENT BLACK HILLS FOREST PLAN DIRECTION FOR MANAGEMENT OF NOXIOUS WEEDS.		
- Comprehensive weed plan complies with all pertinent resource management direction for noxious weed management incorporated in the Forest Plan.	Meets minimal compliance with Forest Plan, does not fully comply with R-2 weed strategy.	Yes Full Compliance with all pertinent regional and Forest direction.
ADMINISTRATION/PLANNING.		
- Integration of noxious weed management risk assessments and mitigation and control measures into Forest planning and analysis, project NEPA documents, and contracts, permits, and agreements as appropriate.	Yes Limited to scheduled project areas	Yes Forest-wide

Chapter III - Affected Environment

INTRODUCTION

In this chapter, the elements of the environment likely to be affected are described.

The project area is the area where activities will occur. The project area is shown in Figure I-1 in Appendix E.

Affected environments pertinent to noxious weed management on the Forest have been documented in previously completed broad-scale analyses and state guidelines and are incorporated by reference:

- FEIS for the 1997 Revised Black Hills National Forest Land and Resource Management Plan; Chapter III, pages III-189 through III-199, 1997.
- FEIS for the Custer National Forest Noxious Weed Management Plan; Chapter III Affected Environment, Pages 19-29, 1986.
- Guidelines for the Coordinated Management of Noxious Weeds for the State of South Dakota, 1992.
- Biology and Management of Noxious Rangeland Weeds. Oregon State University Press. Corvallis, Oregon. 438pp.
- Biology and Management of Noxious Rangeland Weeds; Section II, pages 145-438, 1999.
- Biological Control of Weeds in the West: Western Society of Weed Science, 1995.
- Pesticide/herbicide Risk and Use Assessment; USDA Forest Service Forest Health Protection, Washington D.C., August 1998.

Readers interested in an in-depth discussion of noxious weed infestations affecting the Forest habitats, associated disturbance regimes affecting establishment, and life cycles of target weed species are encouraged to consult these analyses available from the Supervisor's Office of the BHNF, Custer, South Dakota

The remainder of this chapter summarizes pertinent affected environments associated with disturbance regimes and management activities within the Forest that are sources for spread and establishment of weed infestations.

Discussion of the predicted impacts of the action alternatives analyzed in this assessment on human and ecological environments are disclosed in Chapter IV, Environmental Consequences.

OVERVIEW OF THE MANAGEMENT SITUATION

Within the Forest environment, noxious weeds affect the structure, organization, and function of ecological systems in various ways, from nutrient cycling, plant species displacement, and altered activity patterns of animals. Economically, many noxious weeds: 1) reduce land values and net returns by increasing operating costs, decreasing total returns, or both; 2) can be managed locally to decrease land management costs; and 3) have far reaching impacts on local and regional economies.

While current scientific literature and professional experience support implementation of management activities incorporated in the proposed action, management effectiveness and efficiency of proposed weed treatment and control efforts on the Forest are constrained by the lack of scientifically based information on weed biology and ecology (Sheley and Petroff, 1999). Therefore, until the effect of noxious weeds on the structure, organization, and function of our ecosystems and economy are more fully known, future management effectiveness and funding allocations will continue to be based on management experience and observations of Forest personnel.

The Black Hills, including the Bearlodge Mountains, is a prairie-forest environment best described as an "island of mountains surrounded by a sea of grass". The Forest contains a diverse composition of plant community complexes including: grassland, Rocky Mountain and northern coniferous forest habitats dominated by ponderosa pine and white spruce, and a deciduous forest-type of generally eastern species.

The climate of the area represents a near-perfect semi-arid continental climate modified by the Black Hills mountains. Average annual precipitation ranges from 9 inches on the southern hills to about 20 inches at higher elevations in the Hills. About two-thirds of the precipitation falls during the frost-free season, which averages about 100 days at higher elevations to about 150 days in the northeastern foothills. The timing of precipitation combined with the present disturbance regime caused by Forest activities creates ideal conditions for noxious weed invasion.

Management activities that take place on the Forest such as timber harvest, road construction, reconstruction and maintenance, tourism and recreation activities, rangeland management activities such as cattle grazing and effects associated with improvements, land exchanges, and land management activities occurring on adjacent land jurisdictions all have the potential for creating habitat for noxious weeds. Moreover, the entire Forest is susceptible to the invasion and growth of noxious weeds.

A noxious weed is a non-native plant that invades or is detrimental to native plant communities, in many cases displacing and fragmenting native plant communities on entire landscapes. This displacement of native plants results in connected adverse affects to wildlife, livestock, and humans that are dependent on native plant communities. In addition noxious weeds are potentially toxic to wild ungulates and livestock if consumed in large amounts. In addition to federal designation (Section 10 of the Federal Noxious Weed Management Act of 1974), noxious weeds are also designated by the state and

county agencies in South Dakota and Wyoming.

Although Forest management in the past has called for eradication of noxious weeds, a more reasonable expectation is prevention and control. Areas of existing infestation on the Forest that have been mapped and inventoried include approximately 82,000 acres. Acres of projected noxious weed invasion from Forest activities in the first decade of Plan implementation are expected to exceed 22,300 acres. Currently, approximately, 3,000 acres per year are treated on the Forest, and thousands of acres of additional infestations go untreated due to budget limitations. Tables III-1 and III-2 summarize these infestations by district and management activity.

Table III-1: Inventory of mapped noxious weed infestation by District on the Black Hills National Forest.*

DISTRICT	MAPPED INFESTATION (Approximate Acreage)
Northern Hills	23,852 acres
Bearlodge	7,394 acres
Hell Canyon	42,819 acres
Mystic	7,038 acres

*** Mapping techniques utilized to estimate this acreage determination varied by district. Validation monitoring scheduled in accordance with the weed plan will be used to verify actual on-ground infestation levels over the coming decade.**

Table III-2: Predicted noxious weed infestation (acres) from scheduled implementation of Forest activities or programs from 1999-2010*.

ACTIVITIES	MAPPED INFESTATION (Approximate Acreage)
Timber Planning Schedule	6,380 acres
Proposed Prescribed Burn Schedule	340 acres
Proposed New Road Construction	13 acres
Road Reconstruction/Maintenance	2,315 acres
Forest-wide Livestock Grazing Program	5,200 acres
Forest Land Exchanges (1999-2002)	6,690 acres
Campgrounds and Trails Management	324 miles (equivalent to approx. 1,400 acres)

***Predicted infestation levels for timber harvest and road management activities were based on noxious weed infestation rates identified in the Black Hills Forest FEIS (Chpt. III pg, III- 192 thru 194). Infestation levels occurring from prescribed fire, livestock grazing, land exchanges, and recreation management were derived from technical reports included in the project record.**

The affected environment includes all NFS land administered by the Forest that will experience physical and biological consequences resulting from actions taken through project implementation. The affected environment is associated with natural disturbance factors such as wildland fire and implementation of Forest resource management activities. The areas affected and analyzed for resource impacts define the analysis areas. These areas are displayed in the map of the project area that encompasses the entire Black Hills National Forest (Figure I-1 in Appendix E).

DESCRIPTION OF AFFECTED ENVIRONMENT ASSOCIATED WITH NOXIOUS WEED INFESTATIONS.

Based on site-specific mapping it is estimated that the majority of noxious weed infested sites occur where human activity has caused some form of soil disturbance (BHNF FEIS, pg. III-189). Soil disturbance creates an opening or "open niche" for new plant establishment. Noxious weeds have the capability to be prolific seed producers as well as dispersers of seeds, in addition to being extremely competitive in establishing new weed infestations in these areas. The following describes specific types of management within the affected analysis area where noxious weeds are known to have established and are likely to establish in the future.

Transportation Systems/Management

Roadsides along major highways, general forest roads, gravel roads, and two-track non-maintained roads provide optimum conditions for noxious weed establishment on the Forest. The combination of soil disturbance along road systems with human travel provides an opportunity for noxious weed establishment. In addition, annual road maintenance, and road construction/re-construction activities implemented without noxious weed management considerations have escalated the spread and establishment of noxious weeds in the Black Hills during the past decade. Consistent implementation of road construction/maintenance mitigation and control measures is needed to prevent establishment and spread of approximately 2,315 acres of weed infestation predicted to occur in the absence of elevated management over the next 10 years on the Forest from scheduled road construction/maintenance activities.

Road Reconstruction/Maintenance	2,315 acres

Livestock Grazing

Where livestock grazing and hoof action creates unacceptable soil disturbance within grazing allotments, there is a potential for noxious weed establishment and spread. Livestock also transport noxious weed seeds onto NFS land in the hair of their coats or manure. Areas having highest potential for such infestations are sites adjacent to range

improvements such as water developments, fences, and corrals. Livestock driveways, such as those historically used are likely to have weed infestations.

Noxious weeds can establish on areas or sites having naturally high amounts of bare ground. Predicted infestations expected to occur in the absence of improved management from livestock grazing over the decade are estimated to exceed 5,200 acres on the Forest.

Forest-wide Livestock Grazing Program	5,200 acres

Timber Harvest Activities

Areas associated with timber harvest activities that have potential for noxious weed infestation include skid trails, log landings, and parking areas for logging equipment. Seeding and establishing native vegetation such as perennial grass, forbs, and shrubs can minimize establishment of noxious weeds within the logged areas. Some noxious weed species such as bull thistle and Canada thistle often establish after timber harvesting and associated activities. However, bull thistle is short-lived and eventually excluded by native vegetation, where Canada thistle is more persistent. Logging equipment moved onto the Forest from other areas (especially out-of-state) often has high potential for spreading noxious weed seed.

Total acres of expected infestation predicted to occur from scheduled timber management activities over the next 10 years are expected to exceed approximately 6,380 acres, or approximately 638 acres per year.

Black Hills Forest FEIS (Chpt. III pg, III- 192 thru 194).	6,380 acres

Recreation Use Development

Development and maintenance of trails and recreation use sites have a high potential for noxious weed establishment due to the combination of soil impacts and high human activity. Areas such as trailheads, recreation trails, campgrounds, and dispersed camping areas commonly have noxious weeds. Recreation horse and pack stock users have commonly brought in noxious weed seeds with hay and feed for their animals. Trailheads and dispersed camping sites have the highest potential for new weed infestations. It is estimated that approximately 1,400 acres of affected acres of infestation will occur from recreation development and trail construction and maintenance over the next 10 years in the absence of elevated weed management.

Campgrounds and Trails Management	324 miles (equivalent to approx. 1,400 acres)

Utility Corridors

Utility corridors are similar to road systems because of the high amount of bare ground commonly found after construction. Utility corridors with an adjacent road system provide a higher potential for dispersal of noxious weed seeds.

Water Transportation

Ditches and streams located within the analysis area have high potential for weed infestation. The combination of soil disturbance from eroding banks and weed seed transportation through the water creates a high potential for weed infestations.

Prescribed/Slash Burning Activities

While wildfire and prescribed burning are considered beneficial to forest vegetation by causing revegetation and rejuvenation of plants, occurrence and implementation of these types of burns will add to the cost of weed management in the future. Recent burning of timber slash piles and prescribed fire on the Forest implemented in the absence of noxious weed risk assessments, follow-up seeding, and control applications has contributed to the spread and establishment of noxious weeds. Over the next 10 years, implementation of scheduled prescribed burning activities is expected to generate a minimum 340 acres of weed infestation (Table III-2).

Proposed Prescribed Burn Schedule	340 acres

Where wildfire has resulted in high intensity fire, and prescribed burning has been implemented in areas containing high densities of weed infestations, immediate revegetation, follow-up treatment and protection of these sites from livestock grazing are needed to mitigate weed establishment and spread. Noxious weed management issues will need to be incorporated into future assessments of wildfire recovery and burn implementation on the Forest.

Wildland fires burned an estimated 115,553 acres over the last ten years and an average of 11,555 acres per year are consumed by wildland fire. These fires create disturbance conducive to noxious weed spread and establishment.

One cause of weeds infesting areas where wildland fires occur is the result of fire equipment (fire trucks, crew trucks, dozers etc) entering the Black Hills National Forest from other areas outside the Forests immediate area. Weeds collect on the lug tires of vehicles and hitch a ride into the Forest.

Forest Land Exchanges

Acquisition of non-federal land infested with weeds through Forest land exchanges has

contributed to the Forest noxious weed management workload. In many circumstances, noxious weed issues are currently not being considered and evaluated in agency land exchange processes Forest-wide. Incorporation of risk assessments and evaluation of weed conditions and treatment requirements for lands considered for acquisition in the future can mitigate Forest noxious weed control costs and provide decision-makers with better information from which to evaluate exchanges. Acres of National Forest lands being conveyed also need to have an inventory of locations where noxious weeds occur to inform new owners of these lands of possible treatment needs to stop the weeds from spreading. Based on pending exchange evaluations, approximately 6,690 acres of potentially acquired land could increase the Forest noxious weed management workload over the next 10 years.

Forest Land Exchanges (1999-2002)	6,690 acres

Minerals Exploration and Extraction

Lands affected by mineral exploration and extraction vary annually, depending on applications received by the Forest. Mineral and energy development on the Forest, implemented without incorporation of Best Mineral Practices (BMPs) for soil erosion and retention, revegetation with certified noxious weed free seed mixtures, and mitigation for treatment of noxious weeds in project design, permits, and annual operating instructions, has contributed to establishment and spread of noxious weeds.

Wildlife and Fisheries Management

Wildlife and fish habitat management activities may result in small invasions of noxious weeds through ground disturbing habitat improvement activities; structural wildlife improvements needed for habitat enhancement, and forage-improvement projects designed to increase diversity and total quantities of plants in upland/shrub communities may also increase opportunities for weed infestations.

Wildlife and birds are sometimes the source of transport of noxious weed seeds from infested areas to new locations from the coats of animals or ingestion, movement, or deposition. However, the extent of infestation is unknown in comparison to ground disturbing activities Forest-wide.

Habitat features may also be at risk from establishment and long-term uncontrolled spread of noxious weeds. Forage and cover elements to which some wildlife species have adapted may be reduced, which may also affect predators that prey on these species.

The Forest Plan, as amended, includes the following Management Indicator Species:

COMMON NAME	SCIENTIFIC NAME
Bald eagle*	***Haliaeetus leucocephalus***
American marten**	***Marten americana***
Fringe-tailed myotis**	***Myotis thysanodes pahasapensis***
Townsend's big-eared bat**	***Corynorhinus townsendii***
Black-backed woodpecker**	***Picoides arcticus***
Northern three-toed woodpecker**	***Picoides tridactylus***
Northern Goshawk**	***Accipiter gentilis***
Pygmy nuthatch**	***Sitta pygmaea***
Osprey**	***Pandion haliaetus***
Regal fritillary**	***Speyeria idalia***
Cooper's Rocky Mountain snail**	***Oreohelix strigosa cooperi***
Cockerell's striate disc**	***Discus shimeki***
White-tailed deer	***Odocoileus virginianus***
Mule deer	***Odocoileus hemionus***
Elk	***Cervus elaphus***
Merriam's turkey	***Meleagris gallepavo merriami***
Mountain goat	**Oreamnos americanus**
Brown creeper	***Certhia americana***
Mountain lion	***Felis concolor***
Brook trout	***Salvelinus fontinalis***
Brown trout	***Salmo trutta***
Finescale dace	***Phoxinus neogaeus***
Lake chub	***Couesius plumbeus***
Mountain sucker	***Castostomus platyrhynchus***

*** Threatened and Endangered species.**
****Region 2 Sensitive species**

The affected environment, including life history and habitat needs for the above listed species (those MIS that are also threatened, endangered, or sensitive species) is discussed in the Biological Assessment and Biological Evaluation in Appendix C. Please see Appendix C for more information on these species. Species of birds protected under the Migratory Bird Treaty Act will not be affected through application of pesticides used by the Forest Service.

White-tailed and Mule Deer

The deer population in the Black Hills is comprised of approximately 75 percent white-tailed and 25 percent mule deer. Much of the white-tailed population is migratory within the Black Hills with distinct summer and winter ranges, and with an elevation migration between them. Most of the lower elevations of the Black Hills function as winter range. Summer ranges typically have an abundance of forage that allow deer to selectively feed (USDA Forest service 1996).

Elk

Elk use a variety of habitats during the course of a year. They show a preference for forested riparian areas, forested stringers in meadows, dense forests for thermal or hiding cover, and openings for forage. Forests with a diversity of age classes, canopy closures and density can supply both forage and cover requirements (USDA Forest Service 1996).

Merriam's Turkey

This bird was not originally found in the Black Hills, being native to the southwestern coniferous forests. Successful introductions occurred in the late 1940s and early 1950s from Colorado and New Mexico stock. Turkeys use a variety of habitats during the year ranging from dense coniferous stands in winter for pine seed forage and thermal cover to forest openings during early brood rearing. Nesting can occur within a forest stand or in meadows, but characteristically is associated with rocks, outcrops, or shrubs that form horizontal cover (USDA Forest Service 1996).

Mountain Goat

Mountain goats were introduced into the Black Hills in 1924 using stock from Alberta, Canada (Higgins et al. 2000). They inhabit rugged terrain, including ledges, cliffs and rock faces. They usually stay within a safe distance of rocky outcrops, but may seek temporary shelter among trees during severe weather. Grassy, rocky terrain is important during all seasons. Other important habitat includes forested areas used by solitary goats in the summer and fall and by nannies in the spring (Higgins et al. 2000).

Brown Creeper

This is a small, inconspicuous forest bird usually seen scaling tree trunks in search of insects. It is described as an uncommon resident in the Black Hills. Preferred habitats include dense conifers, deciduous and mixed woodlands, especially areas containing trees with a minimum diameter of 10 inches, and loose bark (USDA Forest Service 1996).

Mountain Lion

Mountain lions are solitary animals that prefer rough, rocky terrain in remote areas. Habitat quality depends largely on the availability of prey species. Deer are the most important food item, but they will take a variety of large and small mammals (USDA Forest Service 1996, Higgens et al. 2000).

Brook Trout

Brook trout are not native to the Black Hills. They inhabit numerous streams in the Black Hills. Brook trout prefer cold, clear headwater streams and cold lakes. They also occur in beaver ponds. They prefer water 13.9 to 15.6 degrees centigrade. Water temperature over 25 degrees centigrade is lethal (Black Hills National Forest 2000)

Brown Trout

Brown trout are an introduced species in the Black Hills. They occur in many streams and lakes in the Black Hills and are widely stocked. They prefer cold, clear headwater streams and lakes. They can survive deeper, warmer, slower water than other trout. They prefer water temperatures between 12 and 19 degrees centigrade. Water temperatures above 22 to 28 degrees are lethal. They require non-turbid waters for egg survival (Black Hills National Forest 2000).

Finescale Dace

Finescale dace are a native fish to the Black Hills area. They occur in Ogden, Richardson, Tent Canyon, Spotted Tail, and Crow Creeks; Redwater River, Coxes Lake, and Hemler Reservoir. They are listed as state endangered in South Dakota and rare in Wyoming. Their typical habitat includes cool, spring fed bogs, lakes and creeks, small weedy, sluggish streams and small lakes. They are sometimes found in beaver ponds. They may be sensitive to sedimentation of ponds and pools, reduced oxygen levels in the water, and increased water temperature (Black hills National Forest 2000).

Lake Chub

Lake chubs are native to the Black Hills area. They are considered rare in South Dakota. Their current distribution in the Black Hills is limited to Deerfield Reservoir. They typically prefer cool streams and lakes, but will inhabit virtually any body of water, standing or flowing, large or small. They are most common in gravel-bottom pools and runs of streams and along rocky lake margins (Black Hills National Forest 2000).

Mountain Sucker

Mountain suckers are native to the Black Hills. They occur in a variety of streams in the

Black Hills. Typical habitat includes cold, clear streams and lakes. They mostly occur in small streams with aquatic vegetation or undercut banks. It is one of the few native fish species in the Black Hills and its range in the Black Hills has apparently declined in recent decades (Black Hills National Forest 2000).

Threatened, Endangered, And Proposed R2 Sensitive Species Management

Pre-field review and reconnaissance for the project area identified five federally listed animal species and 46 Region 2 sensitive plant and animal species that exist or may potentially exist within the boundaries of the Black Hills Forest (see Appendix C - Biological Assessment/Biological Evaluation). By altering the composition and structure of required habitats and displacing insects and prey species dependent on those habitats, noxious weed infestation has the potential to adversely affect these listed species through displacement. Also, noxious weed treatments have the potential to affect broad-leaf sensitive plants, as well as broad-leaf plants that serve as reproductive hosts for sensitive butterflies. Where noxious weed infestations occur within sensitive plant sites, control methods that are least likely to impact or kill sensitive plant individuals will be utilized. The presence of noxious weeds is part of the monitoring strategy for sensitive plant species (Phase I Amendment, Appendix F).

For further information on threatened, endangered and sensitive species life history and habitat needs, see Appendix C.

Riparian And Wetland Management

Noxious weed infestations are commonly found in riparian systems within the Forest due to the high level of activity that occurs within those sites and the high potential for weed seed transportation. Many noxious weeds are adapted to riparian areas and are quick to establish on sites where soil disturbance has occurred such as stream banks, blown-out beaver dams, livestock and wildlife bedding areas and undeveloped recreation trails. Canada thistle is one of the most common weeds found in riparian areas within the analysis area.

Soil And Watershed Management

Soil restoration activities are occurring and may result in disturbance that could allow noxious weeds to become established. In these cases, establishment of native plants incorporated in rehabilitation and recovery projects is essential mitigation for noxious weed establishment

Noxious weed infestation has been found to adversely affect the function of soils and watershed systems in many ways: 1) decreased soil infiltration rates and increased runoff have been correlated on sites infested with noxious weeds due to the lower plant cover and crusting of exposed soil; 2) tap rooted plants decrease soil infiltration because they

do not have the dense, fine root systems of grasses, which contribute organic matter and soil structure; 3) dry soils hinder the establishment of native grasses and tree seedlings, thereby increasing soil erosion and sedimentation in Forest watersheds on sites heavily dominated by noxious weeds; and 4) noxious weed infestations have been found to reduce soil nutrient availability and cycling by having higher transpiration and nutrient uptake rates.

Chapter IV – Environmental Impacts Of The Proposed Action And No Action Alternatives

INTRODUCTION

Environmental effects that would occur by implementing the no action and proposed action (Alternatives 1 and 2) presented in Chapter II are disclosed in this chapter. The affected environmental resources presented in Chapter III show the impacts and effects from each alternative. The scientific and analytical basis utilized for the alternative comparisons at the end of Chapter II are presented.

Environmental consequences are described in terms of direct, indirect, or cumulative effects. Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable. Cumulative effects result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.

CUMULATIVE EFFECTS ACTIVITIES

Cumulative effects are discussed and displayed in each resource area section where appropriate. The following is a brief description of all past, present, and future activities identified by the IDT as having potential cumulative effects for one or more resources.

Past Activities

- Timber management projects implemented Forest-wide since 1988.
- Prescribed fire projects implemented Forest-wide since 1988.
- Major wildland fires occurring since 1965, including: McVey, Deadwood, Elk Creek, Galena, Cicero Peak, Jasper, Elk Mountain and Roger Shack Fires.
- Federal, state, and county road construction and maintenance projects since 1988.
- Forest grazing management program since 1988.
- Forest land exchange program implemented since 1988.
- Forest road construction/reconstruction projects implemented since 1988.
- The Forest recreation management program, including: campground use and construction, trails use, including recreational horse riding.
- State tourism.

Present Activities

The following projects and their schedules for completion are based on information available at the time of the analysis. As with all scheduled Forest management activities, this schedule is subject to change based on allocation of Forest budget and resource management issues unforeseen at the date of this analysis.

Timber Management Projects

Forest 5-year timber management program from FY 1999 - FY 2000 (see Figures II-1 through II-4 Appendix E), including:

FY 1999 Timber Management Projects:

- Coyote
- Crawford
- Painter
- Ward
- Angle
- Lemming
- Cavern/Piedmont
- Veteran
- Seventy
- Tollgate

Prescribed Fire Projects

Planned prescribed fire projects FY 1999-2000 (see figures II-1 through II-4, Appendix E).

Land Exchange Projects

Forest land exchange projects (1999): Linde exchange proposal (170 acres); Westphal Exchange proposal (309 acres).

Road Construction and Reconstruction Projects

State Road Projects:

State Highway Construction Projects: U.S. 16/385 north of Custer South Dakota (1999), U.S. 385 Wind Cave to Pringle (1999-2000).

Forest Road Projects:

Forest road construction/reconstruction projects scheduled for FY 2000.

Future Activities

The following projects and their schedule for completion are based on information available at the time of the analysis. As with all scheduled Forest management activities,

this schedule is subject to change based on allocation of Forest budget, appeals and litigation and resource management issues unforeseen at the date of this analysis.

Timber Management Projects

Forest 5-year timber management program from FY 2000 and beyond (see Figures II-1 through II-4 Appendix E), including:

FY 2000 Timber Management Projects:

- Cub
- Wish
- Goat
- Martin
- Big Mac
- Nest
- Mercedes
- Reddog/Slice
- Boulder
- Jimmy
- Red Hill
- Strike

FY 2001 Timber Management Projects:

- Sleez
- Fossil
- Jewell
- Canyon
- Fanny
- Rootbeer
- Hanna
- Rochford
- Roubaix
- Bullock

FY 2002 Timber Management Projects:

- Planting
- Rattlesnake
- Deadhorse
- Jasper
- Lost
- Dougherty
- Gimlet
- Mineral
- Bitter
- Shanks
- Tetro

FY 2003 Timber Management Projects:

- Iron Mountain
- Cabin
- Mitchell
- Dutchman
- Besant

FY 2004 Timber Management Projects

- Windmill
- Buckhorn
- Elk Mountain
- Dowell
- Elmo
- Scout
- Skull
- Timen
- Welcome

FY 2005 Timber Management Projects:

- Palmer
- Prairie
- Higgens

Prescribed Fire Projects

Planned prescribed fire projects, at a level of approximately 8,000 acres of treatment annually, 2003-2010 (see figures II-1 through II-4, Appendix E).

Land Exchange Projects

Forest land exchange projects (FY 2000 - FY 2002):

FY 2000:

- Cale Exchange proposal (Hell Canyon district, 658 acres)
- Hugo Exchange proposal (Northern Hills district, 160 acres).
- McKee Exchange proposal (Northern Hills district, 160 acres)
- Knuckles Exchange proposal (Hell Canyon district, 10 acres)

FY 2001:

- Dakota Exchange proposal (Hell Canyon district, 1600 acres)
- Cascade Exchange proposal (Hell Canyon district)
- Pacer Exchange proposal (Hell Canyon district, 320 acres)

FY 2002:

- Greyhound Exchange proposal (Hell Canyon district)
- Bies Exchange proposal (Hell Canyon district)
- Freitzel Exchange proposal (Hell Canyon district)
- SDDOT Exchange proposal (Mystic district, 103 acres)
- Sachs Exchange proposal (Mystic district, 120 acres)
- Joe Dollar Exchange proposal (Mystic district, 80 acres)

FY2003

- Lien Exchange proposal (Mystic district)
- Homestake Exchange proposal (Bearlodge district, 3000 acres)

Road Construction and Reconstruction Projects

State Road Projects:

State Highway Construction Projects: U.S. 16/385 north of Custer South Dakota (1999), U.S. 385 Wind Cave to Pringle (1999-2001).

Forest Road Projects:

Forest road construction/reconstruction projects and annual maintenance scheduled for FY 2003 - FY 2010.

Recreation and Trail Construction

Construction and maintenance of recreation campground developments and trail construction/maintenance planned on approximately 324 miles of trails, or approximately 1,400 acres affecting weed management from 2001-2010.

Human Health and Safety

Direct and Indirect Effects

Full implementation of either the proposed action or no action alternatives will require the use of herbicides and bio-control agents that have been used on the Forest over the past decade, and are included in the Forest Service approved list of pesticides for use on NFS land and agricultural land within the United States (USDA Forest Service, Forest Health Protection Risk Assessment, 1998). These agents are known to be effective control treatments for the list of noxious weeds pertinent to this project, and in some cases, the only feasible control option. Herbicides are expected to be a continued primary control method used on the Forest under both alternatives.

The risk assessment previously described thoroughly addresses direct, indirect, and cumulative effects of herbicide use. Findings and conclusions of this assessment indicate that risks to public health and safety, or applicators, from proper application of herbicides on forestland or rangeland sites for any chemicals proposed for action in this alternative are low and within acceptable standards for human and environmental safety. All Forest Service applicators will be trained as certified applicators and wear appropriate protective clothing (as required mitigation under the proposed action).

Cumulative effects

Long-term cumulative effects from herbicide applications to the environment and human health from implementation of the Forest program are disclosed in the Forest health risk assessments and Environmental Protection Agency (EPA) studies and disclosures included in the bibliography and planning record for this project. Based on these studies, proposed application rates and intensities of approved herbicides are not anticipated to exceed acceptable thresholds to the environment, or to result in long-term adverse impacts. No adverse cumulative effects are expected from implementation of either project alternative.

Timber Management

Direct and Indirect Effects

Based on effectiveness monitoring of noxious weed management of areas impacted by timber harvest over the past 15 years, Forest personnel have determined that complete eradication of weeds will not occur under most circumstances. Therefore, some level of residual weed infestations will exist on all vegetative management sites. Sites of residual weeds will serve as the source of new infestations to adjacent projects, and in general, all areas of disturbed soils Forest-wide.

Under both alternatives, combinations of action elements including: application of herbicides and bio-control methods, incorporation of Forest Plan soil conservation BMPs (Forest Plan, Appendix D, page D-1), and incorporation of noxious weed mitigation and relevant timber contract provisions into project design of timber management projects are anticipated to mitigate establishment and spread of approximately 6,380 acres of weed infestations predicted to occur from on-going and scheduled timber harvest and associated road construction activities.

Under existing management (Alternative 1), implementation of treatment, control, and monitoring activities is terminated five years after completion of the timber harvest activities in compliance with KV funding restrictions. Under Alternative 2, management and monitoring of timber project areas will continue as needed (beyond 5 years) within and adjacent to timber management projects to attain desired objectives for weed management. This added flexibility to continue treatment is paramount to attaining desired control and containment objectives on existing and future weed infestations that is currently not possible with the existing forest weed management program (Alternative 1). Based on historical monitoring of noxious weed infestation patterns on past timber sales on the Forest, Forest personnel have determined that reductions of as much as 75 percent of existing weed infestations can be expected where treatment and re-treatment methods are applied consistently over 3-7 year intervals (FEIS, pg. III-193).

Moreover, added mitigation requirements, including: pre-treatment of noxious weeds applied to timber sale areas scheduled for harvest activities, ability to treat/re-treat areas adjacent to and within old timber projects, and requirement to wash equipment where harvest and construction activities are occurring within infestation determined to be high risk for spread will provide additive effect to mitigating and reducing existing infestations associated with timber management over the coming decade.

The proposed action will implement noxious weed management direction contained in the Forest Plan and is expected to maintain and improve many native plant communities, including native grasses and forbs. In addition, the proposed action will fully meet vegetative and noxious weed management direction incorporated in the Revised Forest Plan and R-2 Noxious Weed Strategy.

Under Alternative 1, the combinations of integrated control applications described in Alternative 2 will be implemented on NFS land, but these activities will be considerably less in scope, confined to future proposed project areas with minimal county and Forest road applications in affected counties. Under the Alternative 1, the Forest will maintain scheduled target treatment of 3,600 acres. This alternative implements Forest Plan direction at minimal levels and considerably less in scope than Alternative 2.

Cumulative Effects

The Forest's past, present, and future reasonably foreseeable vegetative management projects are listed under the cumulative effects section of this chapter. Implementation of the Alternative 2 is expected to reduce the incremental increase of noxious weed infestation resulting from ground disturbing activities associated with the timber management program over the decade. Under the proposed action, mitigation and preventative treatment strategies applied to past, present, and future vegetative management projects are expected to result in substantial reduction in new infestation, and allow for acceptable containment, reduction, and control of approximately 82,000 acres of existing infestation Forest-wide. Under Alternative 1, spread and establishment of noxious weed infestations resulting from the Forest vegetative management program is expected to increase over the next decade due to the limited scope of treatment.

Management of Sensitive Plants

Direct and Indirect Effects

Under both alternatives, weed management objectives and treatment activities applied in accordance with EPA approved label instructions will continue to protect or enhance threatened, endangered and sensitive plant species in accordance with Forest Plan direction. However, under existing management (Alternative 1) implementation of noxious weed management designed to mitigate displacement of sensitive species populations is largely limited to areas where noxious weed treatment mitigation is applied within timber management projects. Under Alternative 2 expanded treatment and control activities consistently applied to needs within sensitive plant populations outside of scheduled project areas will provide for increased effectiveness in mitigating displacement of sensitive and native plant populations Forest-wide.

The Forest has no threatened or endangered species of plants; however, nineteen species of sensitive plants found on the region's sensitive plant list do occur on the Forest. This may limit opportunities to use chemical treatments for weed management in some areas. Treatment methods are generally restricted to individual plants; however, particular sites of known sensitive species occupation that also harbor noxious weeds may need to be treated by hand pulling of weeds or through the use of biological control agents. Under the proposed action, establishment of bio-control agents and insectaries will continue to be supplemented as needed to attain desired control and containment objectives for noxious weeds.

Under both action alternatives, implementation of herbicide control could adversely impact individuals. However, application of approved herbicides incorporated in both alternatives in accordance with label instructions are formulated to be specific to individual target weed species. The Forest FEIS and attendant sensitive plant biological evaluation analyzed the effects of proposed herbicide and biological control application on sensitive plant population viability, and determined that no trend toward federal listing is expected to occur under implementation of either alternative.

A site-specific sensitive plant species biological evaluation (BE) for the preferred alternative has been completed (Appendix C), with a determination of "may adversely impact individuals, but not likely to result in loss of viability, nor cause trend toward federal listing, Forest-wide". This finding is based on implementation of mitigation measures incorporated in Alternative 2, direction to follow approved pesticide label instructions for application, and site-specific monitoring of treatments implemented within known sensitive species populations Forest-wide, over the past 15 years. This BE applies to implementation of Alternative 2 on existing and predicted infestations within the Forest discussed in this assessment. Implementation of proposed treatment strategies on noxious weeds infestations found outside of proposed treatment areas will be evaluated against this BE and appropriate determinations for conservation and protection of sensitive plants will be completed prior to treatment applications. In addition to this direction, current assessments of Forest Plan direction relative to animal and plant species viability, on-going as a result of the Forest Plan appeal decision, will be incorporated into the decision and attendant BE for this project where appropriate, to provide for added protection and conservation of sensitive plant species.

Cumulative Effects

While implementation of both alternatives is expected to implement Forest Plan direction providing for protection, enhancement, and improvement of native and sensitive species viability during implementation, the cumulative effects of implementing Alternative 2 are expected to provide substantially more enhancement and improvement of sensitive plant species viability over Alternative 1. Not treating noxious weed populations will lead to displacement and loss of sensitive and other desirable native species.

Watershed/Soils

Direct and Indirect Effects

Contributions toward maintenance and achievement of desired watershed/soil conditions Forest-wide can be met through implementation of noxious weed management activities incorporated in both action alternatives. Prevention, control, containment, and reductions of noxious weed infestations in priority Forest riparian habitats will maintain and improve native and desired plant cover within Forest watersheds. Incorporation of risk assessments and mitigation measures in project design of ground disturbing projects will mitigate and provide for reduced establishment and spread of noxious weeds in Forest

watersheds that do not provide adequate cover and stability for soils. In addition, reductions in noxious weed infestations have been found to improve nutrient cycling and water infiltration within treated watersheds, thereby improving native grass composition and reducing soil erosion and sedimentation into Forest streams (Sheley and Petroff, 1999).

At present, it is expected that intensive management (i.e. concentrated application of herbicide, biological, and mechanical treatments) to prevent weed establishment will be needed on only a small acreage of the Forest where restoration work has been done. Under both alternatives, noxious weed prevention and control treatment will be implemented in Forest restoration projects or incorporated in ground disturbing management activities resulting in decreased establishment of noxious weeds. However, under Alternative 2 opportunities to treat and re-treat priority NFS land is expected to achieve project objectives in areas outside of scheduled Forest projects, and therefore, is expected to contribute to the restoration and maintenance of desired conditions in Forest watersheds at greater levels than Alternative 1. Added provisions to develop cooperative agreements and management efforts with key private mining corporations and cooperating ranchers within the Forest are expected to further the development of watershed conditions throughout the Forest.

Under both alternatives, water quality within Forest watersheds should be maintained. Herbicides proposed for implementation under both alternatives have been approved for use on federal and private land if applied following Forest and agricultural application methods. No adverse effects to water quality under the Clean Water Act and/or soil productivity are expected from application of herbicides or other treatments included in the alternatives.

Cumulative Effects

No adverse cumulative impacts associated to soil and water resources are anticipated through implementation of the proposed action.

Fisheries/Riparian Management

Direct and Indirect Effects

Only herbicides registered for aquatic use will be used in riparian and wetland areas. It is assumed that EPA approval of these herbicides has determined that they are not toxic to aquatic organisms. Further, noxious weed treatments under both alternatives will focus on treating individual plants or groups of plants instead of broadcast chemical treatments. Forest Service policies/guidance and EPA label instructions for herbicide application will be followed in implementing all treatment methods. This includes suspending herbicide applications whenever weather conditions may cause off-site drift or runoff, and limiting use of herbicides that pose human health risks. The lowest application rate recommended for effective control of a given undesirable plant species will be used.

Impacts to fisheries and riparian habitat from the alternatives are expected to be similar to those previously mentioned for watershed/soils effects. Under both alternatives, impacts to fish MIS (brook trout, brown trout, finescale dace, lake chub, and mountain sucker) are expected to be benign. Under the proposed action, implementation of noxious weed treatments is expected to improve composition of native and desired riparian plant species on more acres of NFS land. Forest Plan direction for noxious weed management emphasizes the use of biological treatment strategies where feasible. In most instances, application of either alternative in riparian areas will emphasize biological application. However, some applications of herbicides will occur within riparian areas where warranted, following application instructions and protocols to mitigate adverse effects to water quality and fisheries.

Cumulative Effects

No adverse cumulative impacts associated to fisheries/riparian resources are anticipated through implementation of the alternatives.

Transportation Management

Direct and Indirect Effects

Construction, obliteration, and maintenance of roads across the Forest creates sites for the invasion of noxious weeds. Under both alternatives continued establishment and spread of noxious weed infestations associated with road work can be expected to occur at predicted rates Forest-wide (0.12 acres of increase under new construction, and approximately 230 acres of new increase per year, or 2,300 acres over the decade associated with scheduled maintenance). Moreover, noxious weed infestations associated with road management activities occurring on all land jurisdictions within the Forest can be expected to produce connected impacts, producing new weed infestations on adjacent land ownerships unless properly managed.

While prevention and control of the 2,315 acres of weed infestation will be mitigated under both alternatives, under Alternative 2 expected spread and establishment of noxious weeds should be significantly reduced over that of Alternative 1, due to the more comprehensive approach that provides for treatment/re-treatment of more roads across jurisdictional boundaries.

Some roads are no longer needed for forest management. The roads that are obliterated will be possible sites for weed growth until revegetation takes place. Scheduled obliteration activities Forest-wide are expected to contribute to weed establishment and spread at a rate of 0.24 acres per year. Restoration seeding requirements incorporated in both alternatives with certified weed-free seed, applied immediately after disturbance will reduce opportunity for weed growth. In Alternative 2, incorporation of seeding requirements, continued treatment as needed, and incorporation of appropriate noxious weed mitigation in road decommissioning and obliteration activities will control and

reduce more acres of existing and future infestations from road management activities than existing efforts of Alternative 1.

Roads are a source area for noxious weed spread. Seeds are transported on vehicles from other locations on the Forest or from other lands in the western United States. Newly established weeds then move from sites along roads to other areas of the Forest. Under Alternative 2, annual coordination planning with agency/stakeholder road maintenance crews to incorporate weed phenology considerations into the timing of road maintenance activities is expected to improve on current efforts to prioritize cooperative control efforts and treatment priorities with state, county, and private cooperators and reduce the spread of some target weed species. These objectives will be accomplished through agreements and annual operating instructions. These cooperative efforts are expected to substantially reduce spread and establishment of weeds over the decade over that of existing management.

In summary, incorporation of pertinent proposed guidelines, mitigation measures, and control methods for road construction design and maintenance scheduling is anticipated to contribute to the attainment of annual net reductions of existing weed infestations with attainment of Forest Plan and project objectives being implemented at higher levels and intensities in Alternative 2 than existing management.

Cumulative Effects

Under both alternatives, it is anticipated that approximately 2,315 acres of weed establishment predicted to occur from scheduled road construction/ reconstruction and maintenance activities will be mitigated. However, under Alternative 2, existing and new weed infestations on Forest, state, county, and private roads affecting the Forest and surrounding jurisdictions is expected to be reduced at incrementally increased rates over the decade than Alternative 1, due to the more comprehensive approach to management.

Wildlife and Threatened, Endangered, Proposed and Region 2 Sensitive Species

Direct and Indirect Effects

Alternative 2 implements noxious weed management direction incorporated in the Forest Plan at the project level, based on site-specific need for management.

The weed treatment activities and their impacts on wildlife and threatened and endangered species were analyzed to determine effects on species viability in the Forest Plan FEIS and Alternative 2 in implementing this EA. The Forest Plan Biological Assessment (BA) and Evaluation (BE) for affected threatened and endangered species determined that implementation of the Forest Plan, which includes noxious weed

treatment and control methods and implementation activities, "may affect but is not likely to adversely affect" American burying beetles and bald eagles. A determination of "no effect" was made for black-footed ferrets. The recent Phase I Amendment to the Forest Plan (2001) made the same determinations.

Sensitive species were also evaluated in the Forest Plan FEIS and Phase I Amendment. These documents determined that implementation, including noxious weed management, will have "no impacts" on swift fox and purple martin, and "may adversely impact individuals, but is not likely to result in a loss of viability on the planning area, nor cause a trend toward federal listing or a loss of species viability range-wide" for all other sensitive species.

A biological assessment and biological evaluation has been prepared for this EA for treatment of noxious weeds. The table below summarizes the determinations for noxious weed management. For a complete discussion on threatened, endangered, and Region 2 sensitive species, see Appendix C – Biological Assessment and Biological Evaluation for Threatened, Endangered, and Sensitive Species. Note: An abbreviation "May impact individuals…" is substituted for the entire Forest Service Manual (FSM) wording of "May adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide".

Threatened, Endangered, and Proposed Species.

Species	Scientific Name	Status	Summary of BA/BE Finding
American Burying Beetle	*Nicrophorous americanus*	Endangered	May effect, not likely to adversely affect.
Bald eagle	*Haliaeetus leucocephalus*	Threatened	No effect
Black-footed ferret	*Mustela nigripes*	Endangered	No effect
Mountain Plover	*Charadrius montanus*	Proposed	No effect
Ute ladies'-tresses	*Spiranthes diluvialis*	Threatened	No effect

Region 2 Sensitive Species.

Species Name	Scientific Name	Summary of BE Finding
American Marten	*Martes americana*	No impact
Swift Fox	*Vulpes velox*	No impact
Black-tailed Prairie Dog	*Cynomys ludovicianus*	No impact
Dwarf Shrew	*Sorex nanus*	No impact
Fringe-tailed Myotis	*Myotis thysanodes pahapensis*	No impact
Townsend's Big-eared Bat	*Plecotus townsendii*	No impact
Spotted bat	*Euderma Maculatum*	No impact
Northern Goshawk	*Accipiter gentiles*	No impact

Species Name	Scientific Name	Summary of BE Finding
Olive-sided Flycatcher	*Contopus borealis*	No impact
Pygmy Nuthatch	*Sitta pygmaea*	No impact
Black-backed Woodpecker	*Picoides arcticus*	No impact
Three-toed Woodpecker	*Picoides tridactylus*	No impact
Lewis' Woodpecker	*Melanerpes lewis*	No impact
Golden-crowned Kinglet	*Regulus satrapa*	No impact
Purple Martin	*Progne subis*	No impact
Fox Sparrow	*Passerilla iliaca*	No impact
Merlin	*Falco columbarius*	No impact
Upland Sandpiper	*Bartramia longicauda*	No impact
Loggerhead Shrike	*Lanius ludovicianus*	No impact
Osprey	*Pandion haliatus*	No impact
Black Hills Red-bellied Snake	*Storeria occipitomaculata pahasapae*	No impact
Milk Snake	*Lampropeltis triangulum*	No impact
Northern Leopard Frog	*Rana pipiens*	May impact individuals
Tiger Salamander	*Ambystoma tigrinum*	May impact individuals
Tawny Crescent Butterfly	*Phycoides batesii*	May impact individuals
Regal Fritillary	*Speyeria idalia*	May impact individuals
Cooper's Rocky Mountain Snail	*Oreohelix strigosa cooperi*	May impact individuals
Striate Disc	*Discus shimeki*	May impact individuals
American Trailplant	*Adenocaulon bicolor*	May impact individuals
Northern Arnica	*Arnica lonchophylla*	May impact individuals
Greater Bladder Sedge	*Carex intumescens*	May impact individuals
Long-stalk Sedge	*Carex pedunculata*	May impact individuals
Treelike Clubmoss	*Lycopodium dendroideum*	May impact individuals
Southern Maidenhair Fern	*Adiantum capillus-veneris*	May impact individuals
Giant Helleborine	*Epipactis gigantea*	May impact individuals
Large Round Leaf Orchid	*Platanthera orbiculata*	May impact individuals
Great-spurred Violet	*Viola selkirkii*	May impact individuals
Trailing Clubmoss	*Lycopodium complanatum*	May impact individuals
Bloodroot	*Sanguinaria canadensis*	May impact individuals
Dwarf Scouring Rush	*Equisetum scirpoides*	May impact individuals
Marsh Muhly	*Muhlenbergia glomerata*	May impact individuals

Species Name	Scientific Name	Summary of BE Finding
Fox Tail Sedge	*Carex alopecoidea*	May impact individuals
Woolrush	*Scirpus cyperinus*	May impact individuals
Autumn Willow	*Salix serrisima*	May impact individuals
Autumn Coralroot	*Corallorhiza odontorhiza*	No determination.
Prairie Moonwort	*Botrychium campestre*	No determination.

In addition, the National Pesticide Risk Assessment incorporated in this EA for application of approved herbicides has determined that animal and plant species and human safety will not be adversely affected if applied per label instructions. As per sensitive species management discussed previously in this chapter, pertinent considerations for sensitive species management resulting from the on-going Forest-wide viability assessment will be incorporated in Alternative 2 and implemented where appropriate. Moreover, evaluation of wildlife impacts from un-predicted infestations not addressed in this EA will be evaluated against the project BA/BE and the appropriate assessments completed.

Under both alternatives, conservation and enhancement of native plant communities and increases in available forage production, is expected to benefit wildlife that will normally be displaced from Forest habitats from noxious weed invasion. Under Alternative 2 these benefits will be realized over a greater range of Forest than the Alternative 1, in which noxious weed mitigation to Forest habitats is constrained within project areas.

Wildlife Management Indicator Species (MIS). White-tailed deer, mule deer and elk use a variety of habitats during the course of the year. There is a very low risk that these species will consume portions of a plant soon after it has been treated with herbicide. Mountain goats occur in remote, inaccessible areas and have a lower chance of consuming treated vegetation due to the difficulties in treating remote areas with herbicides. The National Pesticide Risk Assessment incorporated in this EA for application of approved herbicides has determined that animal and plant species and human safety will not be adversely affected if applied per label instructions. The risk to these species from herbicide application is far less than the risk of uncontrolled spread of noxious weeds, which has the potential to displace native habitats for these species. Elk use has been noted to increase on winter range immediately following treatments for spotted knapweed (Thompson 1996, as cited in Sheley and Petroff 1999).

Mountain lions prey primarily on deer, but also may prey on other large ungulates. The effects on deer, elk and mountain goat populations will be reflected in mountain lion populations. No adverse effects are anticipated for mountain lions, for the same reasons explained in the previous paragraph for deer, elk and mountain goats.

Turkeys also use a variety of habitats. There is little risk that turkeys will be negatively affected by noxious weed treatments. Once again, the risk to this species from herbicide

application is far less than the risk of uncontrolled spread of noxious weeds, which has the potential to displace native habitats for this species.

Brown creepers feed on insects on the bark of large trees. Noxious weed treatments have little or no potential to reduce large tree density or insects using those trees.

Under both alternatives, conservation and enhancement of native plant communities and increases in available forage production, is expected to benefit wildlife that would normally be displaced from forest habitats from noxious weed invasion. Under Alternative 2 these benefits will be realized over a greater range of forest activities than Alternative 1 in which noxious weed mitigation to forest habitats is constrained within project areas.

Cumulative Effects

No adverse cumulative impacts associated to wildlife, and TES species are anticipated through implementation of the alternatives.

Range Management

Direct and Indirect Effects

Under both alternatives, livestock grazing has the potential to disrupt native plant communities and adversely impact soil stability and productivity when not properly managed. Historically, unmanaged grazing practices that have exceeded proper utilization levels have contributed to establishment and spread of noxious weed infestations.

Under both alternatives, implementation of prescribed utilization levels and grazing systems meeting Forest Plan direction and established in Allotment Management Plans (AMPs) will mitigate establishment and spread of noxious weed infestations through maintenance and provision of desired plant communities. Moreover, implementation of the recently developed Black Hills National Forest Permittee and Wyoming Rangeland Monitoring Guides will provide Forest rangeland personnel and permittees on-going assessment of the effectiveness of prescribed grazing levels in prevention and control of noxious weed infestations. However, proper rangeland management needed to effectively manage existing and future noxious weed infestations on the Forest is predicated on a combination of treatment methods and strategies incorporated in Alternative 2. In either alternative, by removing noxious weeds in rangeland areas, forage production of quality feed is a positive effect to both livestock and wildlife species.

Under Alternative 1, noxious weed management on Forest rangelands is largely limited to areas where timber sales overlap range allotments. In addition, cooperative agreements implementing noxious weed treatment on Forest rangeland is primarily limited to

roadside treatments within two counties. While predicted infestation (approximately 5,200 acres) of weeds associated with the Forest livestock grazing program could be partially mitigated through incorporation of existing Forest Plan direction into existing and future grazing decisions, funding limitations will not likely support this effort, or be effective, without a more comprehensive plan and attendant funding to manage weeds on a Forest-wide basis. Under Alternative 2, predicted infestations associated with livestock grazing will be mitigated and controlled, along with long-term reduction of approximately 82,000 acres of existing infestation on Forest rangeland over the decade. These reductions will be accomplished from the incorporation of noxious weed risk assessments and mitigation measures in existing and future AMPs, ability to treat priority allotment infestations outside timber sale boundaries, and the additive contribution of weed management from cooperative stakeholders (ranchers) within the BHNF per agreements and operating instructions incorporated in Alternative 2.

Action elements including: requirement of certified weed and seed on NFS land, seeding and pre-treatment weed mitigation in scheduled timber sale projects, implementation of the Forest Permittee Monitoring Guide (1999), ability to treat/re-treat infestations as needed, and Forest emphasis on fostering increased public awareness and contribution are all expected to result in long-term prevention and reduction of noxious weeds on rangeland habitats. While these objectives will be met in part under Alternative 1, only under Alternative 2 will these actions be implemented at the intensity and scope needed to fully meet Forest Plan and project objective and achieve long-term net reductions in existing and future infestations.

Cumulative Effects

No adverse cumulative impacts associated to rangeland resources are anticipated through implementation of the alternatives.

Recreation Management

Direct and Indirect Effects

The largest single source of noxious weeds from the BHNF recreation program results from the construction/reconstruction of recreational developments, including trails and their associated use. Special attention needs to be given to prevention on areas scheduled for construction and control and containment of noxious weeds on priority areas of public use.

Recreation use also affects the total number of acres of noxious weeds that occur. Most problems will be in developed sites where undesirable plants will be brought in by motor vehicles arriving on the Forest. Another source of invasion is expected as a result of motor vehicle transport of weed seeds to the general Forest environment from tourism on state highways and forest roads and trails. To date, Forest personnel estimate that their are approximately 324 miles of trails and roads, equivalent to approximately 1,400 acres

of existing weed infestation Forest-wide, in which affective weed prevention and control could reduce noxious weed infestation. Under both alternatives, control and containment methods to manage existing weed infestations will be incorporated into recreational trail management and road maintenance schedules to achieve desired levels of control, containment, and reductions in existing weed infestations where feasible. Both alternatives will treat and eventually remove unsightly noxious weeds in areas where the public views forest/rangeland settings that contain native plant communities.

New weed seeds are sometimes brought to the Forest through feeds supplied to recreational livestock. The infestations that result are likely to be small in area if they are caught early and are treated. The existing Certified Noxious Weed-Free Order incorporated in both alternatives is currently and also expected to substantially mitigate the spread and establishment of weeds from recreational horse use. In addition, the more comprehensive approach of Alternative 2 toward development of cooperative management plans with affected agency and private stakeholders in the Black Hills is expected to improve the coverage of weed management across jurisdictional boundaries over that of Alternative 1, specifically mitigating noxious weed spread and establishment from tourism and campground use. Under both alternatives, the Forest will initiate a certified training program with the States of Wyoming and South Dakota to train campground vendors in herbicide application. Also included in both alternatives are provisions currently in the permit to require campground concessionaires to treat and manage noxious weeds within Forest campgrounds. These provisions will be incorporated in future Forest wide special-use permits beginning in the year 2002.

Cumulative Effects

No adverse cumulative impacts associated to recreation resources are anticipated through implementation of the alternatives.

Wilderness Management

Direct and Indirect Effects

Management for wilderness values does not directly affect noxious weed invasion. However, recreational livestock have indirectly affected noxious weed invasion in the Black Elk Wilderness area through fecal distribution. Additionally, any feeds carried into the wilderness for use by these animals that is not certified as weed-free may be the source of invasion material. Continued Implementation of the existing Forest Certified Weed-Free Feed Order incorporated in both alternatives will mitigate spread and establishment of noxious weeds in the Black Elk Wilderness long-term.

Cumulative Effects

No adverse cumulative impacts associated to wilderness resources are anticipated through implementation of the Proposed and No Action alternatives. Not treating noxious weeds will result in long-term loss of natural ecosystem attributes characteristic of the Black Elk Wilderness.

Fire/Fuels Management

Direct and Indirect Effects

Historically on the Black Hills National Forest, wildfire suppression activities, prescribed fire planning and implementation, and timber sale burning activities have contributed to the establishment and spread of noxious weeds.

In 1999, total burn activities associated with prescribed fire and brush/slash disposal associated with timber management were approximately 28,000 acres Forest-wide. The current Forest prescribed fire planning schedule through FY 2005 schedules approximately 17,000 acres of habitat burning to improve timber, wildlife, recreation and rangeland habitats Forest-wide. Based on predicted noxious weed infestation rates associated with wildfire and management burns over the past 15 years, Forest personnel estimate that approximately 340 acres of weed infestation will occur from these projects in the absence of noxious weed mitigation and prevention measures. These measures include use of site-specific risk assessments to determine appropriate project design approaches and mitigation measures for prescribed burn plans to mitigate establishment and spread of noxious weeds, pre-treatment of areas prior to implementing project burns, and determination of appropriate seeding mixtures and schedules to establish rapid revegetation of burn sites.

Both alternatives incorporate appropriate treatment of noxious weed infestations for timber and prescribed fire project burning to provide for prevention and mitigation of predicted fire-induced weed infestation. However, Alternative 2 provides for added mitigation of weed infestation through wildfire recovery assessments currently not being conducted.

To reduce the impact of noxious weeds entering the Forest, all emergency equipment used in fire suppression, except for initial attack, and other emergency situations will be required to wash off their tires and undercarriage before entering and leaving the Black Hills National Forest. No additional weeds need to be brought into the Forest from other areas and no noxious weeds on the Forest need to be distributed to other areas of the nation.

Both alternatives include provisions that require revegetation with certified weed free seed and allowance for follow-up control treatments to prevent and mitigate new weed establishment.

Cumulative Effects

The additive effect of implementing fire management planning and mitigation measures incorporated in both alternatives in the Forest prescribed fire, wildland fire suppression, and timber management programs is expected to mitigate potential cumulative effects of increased spread and establishment of noxious weeds on approximately 17,000 acres of burn projects scheduled for FY 1999-2005, and future projects over the next decade. Wildland fires have consumed an estimated 115,553 acres over the last 10 years. Burned sites typically host new or increased noxious weed populations. Both alternatives will treat acres found to have noxious weeds as a result of fire occurrences be they prescribed or wildland. Fire/fuels management is one of the few programs that is able to acquire funding from many sources to treat noxious weeds.

Economics

Direct and Indirect Effects

Under the Alternative 1 the Forest noxious weed treatment program has been limited to implementation of noxious weed prevention and control measures associated with timber management projects. Sale area improvement funding from the Knutson-Vandenberg (KV) Program is the principle source of program funding. A small portion of Forest funding is allocated to participating counties within the Forest in support of herbicide application on Forest and county roads.

To date, the Forest allocates little funding (aside from KV funding) annually to meet Forest Plan direction to treat approximately 3,600 acres of noxious weed infestation Forest-wide under Alternative 1. The Forest weed managers spend approximately $126 per acre to treat noxious weeds with herbicides on the Forest. An additional $90 to $228 per acre is spent on bio-control applications depending on what weed needs to be treated, and field reconnaissance and expenditures for monitoring of noxious weeds is estimated at $8 per acre.

Under the proposed action, the Forest will implement regional direction to allocate an additional $86,000 of appropriated multi-resource funding to implement cooperative and integrated prevention and control measures on forest habitats outside timber management projects and on all NFS land within the Forest prioritized for treatment. The proposed program contains provisions to increase funding as Congressional budget allocations permit, as well as supplement weed management strategies with cost sharing with participating cooperators. As a result, Forest treatment and control of noxious weeds under Alternative 2 will increase.

With implementation of more comprehensive treatment and comprehensive management featured in Alternative 2, including: integrative prevention and control and cooperative strategies with affected stakeholders, the Forest expects operational costs to manage noxious weed infestations to reduce over the long-term.

Under Alternative 1, the Forest will continue to implement Forest Plan and regional weed management direction within scheduled projects, primarily constrained to KV funding in timber management projects, which will result in continued increases in weed infestation levels on NFS and adjacent lands over the coming decade. These increases are expected to result in increased operational costs to implement scheduled projects long-term.

Increased operational costs for Forest projects are only part of the economic impact of escalating noxious weed infestation in the Forest. Decreases in land valuation, loss of forage and soil production, and displacement of wildlife and their habitat have consequences of increased direct and secondary costs to local and regional economies. Based on 1993 assessments of economic consequences of increased leafy spurge infestation in Montana, Wyoming, North Dakota, and South Dakota on land valuation and production, direct and secondary losses to federal, state, and private land agencies exceeded $129 million. Implementation of Alternative 2 is expected to decrease operational costs and Forest and adjacent land ownerships over the long-term at substantially greater levels over Alternative 1.

Cumulative Effects

If noxious weeds continue to thrive without funding being available to prevent, treat and kill them, appropriated funding will have to increase to meet the demand placed on State lands, private landowners and federal landownership to deal with the situation. Economics is similar to every other resource that is affected by noxious weeds in that if the weeds are left to multiply, negative impacts are the result. More money will be spent that could have been spent on productive management.

Minerals Exploration and Extraction

Direct and Indirect Effects

After mining exploration or production is completed impacted sites will need to be rehabilitated and revegetated with native species to prevent the spread of weeds. Gradually, a stable, native vegetation species mix will re-establish on the disturbed areas and weeds will be excluded.

Both alternatives require the incorporation of Best Mineral Management Practices (BMMPs) in the Forest Plan in the development of operating plans for mineral exploration and extraction to prevent spread and establishment of noxious weeds. Rehabilitation and revegetation measures included in these BMMPs will maintain the soil resource and prevent soil erosion invasion and spread of noxious weeds. In addition, implementation of the monitoring schedule incorporated in Alternative 2 will assess the effectiveness of BMMPs over time in preventing new weed infestations Forest-wide.

Cumulative Effects

The noxious weed plan is not expected to affect mineral exploration and/or extraction but would increase costs to rehab ground disturbing areas by requiring native seed be planted and treating for noxious weed infestations for a period of three to five years.

Utilities Development

Direct and Indirect Effects

Under either alternative, the construction and maintenance of utilities could impact the weed management program. The most significant factor will be the disturbance of the soils and existing native vegetation. Site-specific mitigation measures incorporated in both alternatives, including revegetating disturbed areas using certified weed-free seed will quickly return these sites to conditions where weeds cannot establish themselves. Noxious weeds can spread from these areas onto both private and adjacent Forest resulting in expensive control projects.

Cumulative Effects

No adverse cumulative impacts associated to utility development is anticipated through implementation of either alternative.

Land Exchanges and Special Uses

Direct and Indirect Effects

Under both alternatives proposed and existing activities authorized through the issuance of Forest special use permits will be evaluated for potential to increase spread and establishment of noxious weeds. Where proposed activities have the potential to establish new infestations or increase the spread of existing weed infestations, site-specific risk assessments and mitigation measures will be incorporated in special use permits and agreements to mitigate weed spread and establishment and maintain populations of native plant populations within activity areas that out-compete invasive weeds. Incorporation of these measures, where appropriate, in special use permits is expected to contribute to retarding and reducing the long-term spread of existing weed infestations Forest-wide.

In addition to special use activities, Forest land exchanges have the potential to increase noxious weed management workload Forest-wide through acquisitions of lands infested with noxious weeds. Where these exchanges have occurred without necessary coordination with Forest noxious weed personnel, noxious weed infestation and spread to adjacent Forest and non-Forest lands has resulted in increased Forest costs and workload to manage acquired infestations. Under both alternatives, noxious weed survey and

evaluation of proposed land exchanges will be a component of the land valuation and exchange analyses prior to Forest approval of the exchange. This process is expected to result in decreased public cost to manage overall Forest weed infestations and reduced weed infestations Forest -wide in the long-term.

Cumulative Effects

Due to the extensive component of fragmented land ownership within the Forest, it is the Forest's intent to consolidate land holdings to improve the cost efficiency of managing NFS land within the Forest boundary. As a result the Forest land exchange program is quite active. In addition to past exchanges, the Forest is currently engaged in evaluations for proposed land exchanges. Approximately 17 proposals involving 6,690 acres are anticipated for evaluation and decision over the next five years. Under both alternatives, the additive effect of land exchanges on spread and establishment of new noxious weed infestations should be substantially reduced and existing populations should be controlled at acceptable levels.

Other Activities

The effects expected on the noxious weed program from other resources are all considered to be indirect. Management of the Forest for multiple use outputs results in disturbance of the soil surface. Noxious weed biology is such that as acceptable habitats are created, invasion and establishment of new plant populations can be expected from existing weeds population centers (They are the seed sources.). The prevention and treatment of noxious weeds potentially can increase the operating costs of all resource operations on the Forest.

PROBABLE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

Proper application of approved herbicides incorporated in both alternatives are expected to pose no harm to human health or safety, or result in adverse effects to the ecology of target application areas. However, mis-application of herbicides to non-target species or accidental spillage through application, equipment malfunction, or vehicle accident may occur. In the unlikely event of spillage, the Forest will invoke mitigation and removal protocols incorporated by either the State of South Dakota or Wyoming depending where the spill occurs. EPA approved guidelines for handling and cleanup will be followed. Implementation of other treatment activities incorporated in the proposed action is not anticipated to produce unavoidable impacts. The Clean Air Act will be met and complied with by meeting all relevant state and federal air quality regulations and control.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

There is no irretrievable or irreversible commitment of resources associated with the alternatives. This determination is based on highly controlled design and application protocols and mitigation measures incorporated in Alternative 2 that minimize potential direct and indirect effects. In the long term, it is possible to incur irretrievable and irreversible effects if Alternative 1 is implemented. Failure to take sufficient action on the control of highly aggressive noxious weeds could allow for major infestations and displacement of native plant communities across thousands of acres of Forest and non-Forest lands within the Forest boundary as is the case of wide-spread infestation of leafy spurge throughout Montana and in the Boise River system in Idaho. Although control efforts have been aggressive in the Black Hills, the spread of leafy spurge has reached irretrievable proportions. Other aggressive noxious weeds, such as spotted knapweed, have that same potential for spread within the Black Hills National Forest and its intermingled private land.

RELATIONSHIP BETWEEN SHORT-TERM USE AND LONG-TERM PRODUCTIVITY

Implementation of Alternative 2 is expected to increase long-term productivity, land valuation, and aesthetic values of treated rangeland and forest habitats within NFS land and adjacent state and private lands within the Forest boundaries. In the absence of project implementation (adoption of Alternative 1), long-term forage production needed to maintain/or achieve Forest Plan direction relative to livestock and wildlife management would be reduced and more constrained. Connected to this effect, land valuation, associated land productivity, visual quality, and potential to provide quality recreational experiences are expected to be reduced on both NFS land and affected non-Forest jurisdictions.

POTENTIAL CONFLICTS WITH PLANS AND POLICIES OF OTHER JURISDICTIONS

The proposed action is designed to incorporate and meet land management objectives of affected state, private, and federal jurisdictions. Implementation of Alternative 2 will implement and comply with land management direction incorporated in affected management plans. Implementation of Alternative 1 will meet Forest Service policy direction and noxious weed management direction incorporated in State statutes of Wyoming and South Dakota at lesser levels.

SPECIFICALLY REQUIRED DISCLOSURES

Public Health and Safety

Potential effects of herbicide and biological treatments on the human and ecological environment were addressed in the Human and Ecological Health section of this chapter. This assessment has determined that proper implementation of the alternatives will not pose any risk to public health and safety. Potential risk to workers applying herbicides will be reduced to acceptable levels and mitigated through proper training, job hazard analyses, and use of protective equipment.

UNIQUE CHARACTERISTICS, INCLUDING HERITAGE RESOURCE PROTECTION

Implementation of Alternative 2 will not adversely effect the unique characteristics of such things as historic, Native American or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas. As described in the purpose and need for action and in the direct and indirect environmental consequences, project design for the proposed action was configured to protect and maintain unique characteristics found within the analysis area, and mitigate potential adverse effects. It should be noted that implementation of the Alternative 1 could have an adverse impact on adjacent non-Forest lands within the Forest boundary if existing and potential weed infestations were not treated or managed.

Heritage resource surveys will precede ground disturbing management actions that could damage heritage resources. Implementation of both alternatives may include some ground disturbing activities. Sites found during these surveys will be protected as required by Forest Plan direction and applicable agreements with South Dakota and Wyoming State Historical Preservation Officers (SHPOs) and affected Tribal Councils, in addition to current laws and regulations (National Historic Preservation Act of 1966 PL 89-665 and Executive Order 11593, as stated in the Code of Federal Regulations 36 CFR 800).

ENVIRONMENTAL JUSTICE AND CIVIL RIGHTS

Project scoping has not revealed the project to be highly controversial or unique in effect to persons or organizations affected by Forest management. Moreover, no violation or adverse impact to the civil rights or liberties of any persons of organizations is anticipated through implementation of either alternative. Appropriate coordination and consultation will be undertaken if these affects are discovered during project implementation.

UNIQUE OR UNKNOWN RISKS

The risks and expected effects associated with implementation of herbicides and biological treatments incorporated in Alternative 2 have been determined to be consistent with findings and analyses documented in an array of herbicide and biological treatment assessments conducted during the past decade. Based on these findings, unique or unknown risks associated with implementation of Alternative 2 are not anticipated. Moreover, project design incorporates relevant treatment applications and methods suggested in these studies. Accordingly, design features, findings, and conclusions documented in the Black Hills National Forest Noxious Weed Management EA are tiered to the following Risk Assessments and Guidelines for Herbicide Use and Bio-Control Applications for Noxious Weed Management: Forest Service Regions 1,2,3,4 and 10, Sept. l992, the Risk Assessment clarifies and quantifies the potential risks associated with use of herbicides which is part of both alternatives.

PRECEDENT SETTING DECISION

The decision to be made is consistent and within the scope of similar agency decisions relative to the management of noxious weeds that have been rendered during the past decade. Moreover, the decision to be made is consistent with the Forest Plan and up-dated regional direction associated with timely implementation of noxious weed management strategies. The decision to be made is not expected to establish a precedent for future actions with significant effects.

Chapter V - Consultation And Coordination

The following persons, firms and/or agencies contributed data, analysis, review or guidance to this Environmental Assessment.

USDA FOREST SERVICE

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Regional Staff:

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Following is a list of consulting agencies, organizations, and persons to whom the a copy of the Environmental Assessment has been sent:

COOPERATING AGENCIES:

Federal Agencies and Officials:

State of South Dakota:

Senator Tom Daschle
Senator Tim Johnson
Representative John Thune

State of Wyoming:

Senator Michael B. Enzi
Senator Craig Thomas
Representative Barbara Cubin

Natural Resource Conservation Agency:

Custer County Conservation District

Buffalo Gap National Grassland:

Fall River Ranger District

National Park Service:

Wind Cave National Monument
Jewel Cave National Monument
Mt. Rushmore National Monument

TRIBAL AGENCIES:

Edward Starr Jr, Tribal Chairman, Cheyenne/Arapahoe Business Council
Norman Wilson, Tribal Chairman, Rosebud Sioux Tribe
Gregg Bourland, Tribal Chairman, Cheyenne River Sioux Tribe
Butch Denny, Tribal Chairman, Santee Sioux Tribe of Nebraska
Deirdre Desmond, Cheyenne River Sioux Tribe
Anthony A. Addison Sr., Northern Arapaho Business Council

Harold Miller, Tribal Chairman, Crow Creek Sioux Tribe
Andrew Grey, Tribal Chairman, Sisseton-Wahpeton Sioux Tribe
Philip G. Longie, Tribal Chairman, Spirit Lake Sioux Tribe
Charles W. Murphy, Tribal Chairman, Standing Rock Sioux Tribe
Tom Ranfranz, Tribal Chairman, Flandreau Santee Sioux Tribe
Steve Cournoyer, Tribal Chairman, Yankton Sioux Tribe
Michael Jandreau, Tribal Chairman, Lower Brule Sioux Tribe
Standing Rock Sioux Tribe, Dept. of Water & Natural Resources
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Wesley Hansen, Flandreau Santee Sioux Tribe
Harold Salway, President, Oglala Sioux Tribe
Tex Hall, Tribal Chairman, Three Affiliated Tribes

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Elgin Crows Breast, Cultural Preservation Office, Three Affiliated Tribes
Mr. Tim Mentz, Sr., Tribal Historic Preservation Officer, Standing Rock Sioux Tribe
Michael Graham, Oglala Sioux Tribe, Fifth Member

STATE AGENCIES AND OFFICIALS:

State of South Dakota:

Office of the Governor, Honorable William Janklow
Department of Agriculture, Dr. Henry Burkwhat
Department of Fish and Game and Parks, John Cooper, Director
South Dakota Weed and Pest Commission, Kevin Fridley
State Historical Preservation Officer
Department of Environment and Natural Resources, Dr. Dennis Clark
South Dakota State University, Dr. Leon Wrage

State Representatives:

Jerry Apa, SD House of Representatives
JP Duniphan, SD House of Representatives
James B Dunn, SD Senate
Scott Eccarius, SD House of Representatives
Carol E Fitzgerald, SD House of Representatives
Richard E Hagen, SD House of Representatives
Arlene H Ham, SD Senate
Carole Hilliard, Lieutenant Governor
Cheryl Madden, SD House of Representatives
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Jerry J Shoener, SD Senate
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Mike Wilson, SD House of Representatives
Mark Young, SD House of Representatives

State of Wyoming:

Office of the Governor, Honorable Jim Geringer
Department of Agriculture and Natural Resources, Cheyenne Wyoming, Grant Stumbaugh (State Clearing House Coordinator).
Department of Weed and Pest Control, Cheyenne, Wyoming,
State Historical Preservation Officer

State Representatives:

Bill Barton, WY Senate
Ross Diercks, WY Senate
Marlene Simons, WY House of Representatives

COUNTY WEED BOARDS AND COMMISSIONS:

State of South Dakota:

Pennington County Weed and Pest Commission
Custer County Weed and Pest Commission
Lawrence County Weed and Pest Commission
Fall River County Weed and Pest Commission
Mead County Weed and Pest Commission

State of Wyoming:

Crook County Weed and Pest Commission
Weston County Weed and Pest Commission

BUSINESSES:

Homestake Mining Corporation

ORGANIZATIONS:

Multiple Use Coalition
Friends of the Bow
Biodiversity Associates
Prairie Audubon Society
Bootstraps Organization
Lawrence County Livestock Association
Beaver Creek Cattle Association

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Kenneth Scott
John Stovall

In addition to the above individuals, many residents of the Black Hills participated in public scoping meetings and submitted oral input to the proposed plan. Records of meeting registrations and general comments submitted by these individuals have been incorporated in the analysis and are part of the project planning record. Information pertaining to the planning record may be requested through the project leader, identified at the beginning of the document.

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